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CONTENTS.

	Page
INTERNATIONAL CONFERENCE OF TEACHERS OF GEOGRAPHY, SHEFFIELD, AUGUST, 1951. Report. Alice Garnett and T. W. Brown	221
WORLD LAND USE SURVEY. J. Callow	231
SOME NOTES ON THE GROWTH OF POPULATION IN THE CANNOCK CHASE COALFIELD. M. J. Wise	235
THE DISTRIBUTION AND LOCATION OF STEAM-DRIVEN POWER STATIONS IN GREAT BRITAIN. E. M. Rawstron	249
THE "DUTCH" VILLAGES IN POLAND. W. Maas	263
OBITUARY	269
CORRESPONDENCE	270
GEOGRAPHICAL ASSOCIATION	271
REVIEWS OF BOOKS	274
INDEX	287

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THE INTERNATIONAL CONFERENCE OF TEACHERS OF GEOGRAPHY

SHEFFIELD, AUGUST, 1951

REPORT BY THE HON. CONFERENCE SECRETARY AND THE
HON. SECRETARY OF THE ASSOCIATION

SINCE October, 1949, the Executive Officers of the Association have had under consideration the desirability of strengthening the contacts between teachers of geography in this country and their colleagues abroad, and between our Association and similar associations or societies of geography teachers in other countries. In particular they have felt that much good would come if a conference could be organised in this country which would be widely attended by representatives of such foreign associations. Accordingly in December, 1950, invitations were sent to all known associations of geography teachers abroad, and in their absence to Ministers or Directors of Education, or in some instances to individuals through the good offices of the British Council. Arising from this a first international conference of teachers of geography, sponsored and organised by the Geographical Association, was held in Sheffield from 30th July to 7th August, 1951. Nearly 100 delegates and members attended, including representatives from seventeen countries¹ and five continents, from places as far afield as Brazil, Canada, South and East Africa, Thailand and Australia.

The Association is much indebted to the University of Sheffield for the hospitality offered in the University buildings and the Halls of Residence, to the Lord Mayor and Lady Mayoress of Sheffield for a reception given by the City, at the Town Hall, and to the British Council who met the cost of the transport of the Sheffield City excursion. At the several inaugural functions arranged, speeches of welcome to the delegates were made by the Lord Mayor and the Pro-Vice-Chancellor of the University, to which replies were made by Professor Fleure, Professor Dudley Stamp, Dr. Wreford Watson (Canada), Professor Brüning (Germany), Dr. Reumert (Denmark) and Dr. Jong (Holland).

The programme was a full one including as it did a series of strenuous excursions interwoven in the programme of lectures and discussions. The excursions, which in all covered more than 500 miles, were designed to give delegates an appreciation of the urban geography of Sheffield, of the local region of the High Peak and of the contrasts present within the South Yorkshire coalfield, together with two long and very energetic days spent in examining a cross-section

¹ Australia (New South Wales), Belgium, Brazil, Canada, Denmark, Egypt, Germany (Western Zone), Gold Coast, Great Britain, Holland, Northern Rhodesia, Sierra Leone, South Africa, Sweden, Tanganyika, Thailand, Uganda.

of Britain through Sheffield from coast to coast, from Grimsby to Liverpool. These two excursions gave members an opportunity of seeing a really wide variety of physical and cultural landscapes within contrasting sectors of rural and industrial Britain. The historic cities of Lincoln and Chester, and (in an optional excursion) York, offered a striking contrast to the urban developments and encroachments of Sheffield, Manchester and Liverpool.

The Association is much indebted to the staff of the University Department of Geography who led the excursions, and especially to members of the Lincoln, Liverpool, Manchester and Sheffield branches of the Association, who co-operated so successfully in their respective regions. To the Liverpool branch the conference was especially indebted for the fine view of the great seaport which was arranged from the over-head railway and in the course of a river trip on the Mersey. Altogether, four of the eight conference days were devoted to field geography.

The remainder of the conference was spent in lectures and discussions dealing mainly with matters concerned with the teaching of the subject except in the case of lectures on "The Rise and Growth of Sheffield" by Professor Rudmose Brown and "The Geography behind the Excursion Programme" by Professor Linton given as an introduction to the field studies, and a paper read by Professor Brünig on Land Planning in Germany. There were also two programmes of films selected by the Association's Standing Committee for Visual Aids in Education.

Throughout the conference, a large exhibition of elementary and advanced textbooks, visual aids, atlases, sheet- and wall-maps was available for inspection, and stimulated many informal discussions. These exhibits were submitted for display by both British and foreign publishers and conference members, and many were later presented to the Association's Library; this opportunity is taken to express thanks for these valued gifts.

The inaugural lecture given by Professor Dudley Stamp (Great Britain) was entitled "Geography in the Education of the World Citizen." After sketching the history of geographical teaching, from the "list" geography of fifty years ago through "causal" geography, to "human ecology" Professor Stamp related man to his environment, and emphasised the need for the recognition of the study of the factor of time in addition to those more generally accepted. He stressed the importance of geography's contribution to the future in planning; it is the only subject which views the picture as a whole, and therefore the teachers must try to present the world picture to pupils, and teach the geography of each country with reference to its world setting. He illustrated this point of view with reference to specific topics and countries, and finally made a plea for the recognition of geography as an essentially practical subject which must find outlet in map work, field work, and the study in the field of land use, leading to the future outlook of "land planning."

In a subsequent discussion of this lecture, the need was stressed for properly trained teachers of geography, and an orderly sequence of textbooks from the Primary School stage onwards. Some members drew attention to the problem of keeping school textbooks up to date, a problem now both acute and complex. To meet this difficulty Professor Stamp urged the more general use by teachers of the four standard reference works, viz., the *Statesman's Year-book*, *Whitaker's Almanack*, the *Minerals Year-book* and the *Year Book of Food and Agricultural Statistics*². The use of accurate practical mapping, even by young children, was stressed, and the value of work by British school children in the collection of material for the Land Utilisation Survey was cited in this connection. Dr. Jong emphasised the need for the study of sociological no less than physical influences in the study of human geography, and gave two examples in Holland where man's use of the land was entirely dominated by sociological and not physical factors. Dr. Petit (Belgium) reported that in his country the analysis of landscapes played a major role in the teaching of geography. Dr. Knübel (Germany) showed that in contrast to the geography of fifty years ago, in Germany "the human factor" is beginning to find a more prominent place; but the regional concept based on the comparative analysis of landscape is the present day basis of teaching in German schools.

Professor Bowen (Great Britain) opened a discussion on *Geography in Relation to Other School Subjects* with a provocative and stimulating address in which he stressed that, however broad our definition of geography may be, it could not in any circumstances neglect the physical basis, which was a safe anchorage especially at a time when so many people thought that geography consisted of the study of distributions of all kinds. In that sense every subject had a geographical aspect and every subject was closely allied to geography. He argued that geography is most closely related to those subjects whose content permits of close integration with the physical environment. Geology, biology (especially botany) and history stand out in this respect. Professor Bowen showed that there was much to be said for teaching geology as a school subject, not only for its practical but also for its cultural value, in secondary modern and grammar schools. In the second part of his talk Professor Bowen gave three practical demonstrations of the ways in which the close relationship of geography with geology, botany and history could be emphasized in the classroom.

² *The Statesman's Year-book*. London. Macmillan and Co. Ltd. 36/-.
88th annual publication in 1951.

Whitaker's Almanack. London. Jos. Whitaker, 13, Bedford Square, London, W.C.1. Cloth 12/6. Shorter edition, paper 7/6. Established 1868.

Minerals Year-book. Washington, D.C. United States Department of the Interior. \$4.25.

Year-book of Food and Agricultural Statistics. (English, French and Spanish in one edition). Washington, D.C. Food and Agriculture Organisation of the United Nations. Vol. IV, Part 1, Production, and Part 2, Trade. 1950. 24/6 each part.

The first (geography and geology) illustrated from an ordnance survey sheet the use that could be made of the importance of surface outcrops in determining the nature of the drainage pattern in chalk and clay lands respectively. The second (geography and botany) showed how direct observation by children of the dates of flowering of common wild plants could be built into an isophenic map which offered convincing correlations with relief, climate and soil conditions. The third (geography and history) gave an entertaining picture of the expansion of the U.S.A., state by state, with reference to the physical background and the changing economic condition of the interior of North America during the 18th and 19th centuries.

The symposium on the *Position and Scope of Geography in Schools in the Countries Represented* was opened by Dr. Jong, who reported that, in Holland, geography is taught because it gives a valuable knowledge, not because it is a mind trainer. Although the physical background must be the basis of logical geographical treatment, the real aim of geography must be to give pupils a knowledge of the peoples of the world and, where time is limited, the human viewpoint must take precedence over the physical. The cultural background of the homeland must be compared with that of other countries. In Dutch secondary schools the first and third year is devoted to a study of Holland and the Netherlands Indonesian Union. The second and fourth to a general survey of the world and to specimen regions. In the fifth and sixth year pupils study physical geography and social anthropology.

Mr. Haggag (Egypt) limited his remarks to primary schools. He said that 1937 was the year when geography ceased to be the teaching merely of pure facts and when the British method of treatment with the inclusion of the study of local geography was adopted. The syllabus is drawn up by the Minister of Education who also conducts the examinations. The aim is to teach the pupil to think for himself and to this end activity geography and map work, centred upon the local region, plays a large part. The treatment veers towards emphasis of the human rather than the physical side of the subject.

Dr. Nilsson (Sweden) outlined the basis of a secondary school course in Swedish schools to be developed in the near future which will make possible the study of the whole world. In the elementary schools geography is treated regionally, with local geography predominating. In the secondary school two years are spent on the study of Europe, two more on other continents and the fifth year on Sweden's economic geography. In the *Gymnasium*, the study of economic geography is in the foreground, with a more detailed consideration of Sweden and her neighbours. During the last two years, geography is an optional subject.

Miss I. Stevenson (Great Britain) in comparing Great Britain's aims and methods with those outlined above, emphasised that whilst examinations are not a goal, the most important one from the pupils'

standpoint (General Certificate of Education) demands a world knowledge of geography. Teachers in Great Britain seem to be allowed a freer scope in methods of teaching, and a greater degree of flexibility in the creation of their syllabuses. Generally speaking, regional treatment forms the basis of geography teaching with the addition of local studies. It is a subject which offers great scope, as it is both a Science and an Art, but a properly equipped geography room is essential if it is to be effectively taught.

Dr. Reumert stressed the advantage of geography as a training in world citizenship, and expressed the view that the treatment of world geography should be given three times the length of time given to the treatment of the mother country. He insisted that even the smallest countries should be included—first in broad outline and later in greater detail.

Dr. Petit reported that generally speaking, teaching in Belgium is divided as between Primary Schools (7–14), Secondary Schools (12–18) and the University. In the Primary Schools there is no formal geography lesson in the first four years, but the study of *Centres d'Intérêt*. In the fifth year study of the local region is begun and, in the following years, of Belgium, Europe and the World. In the Secondary Schools initiation to geography in the first year is through local and regional studies and the study of Belgium; in the following years Europe, the World, and Elements of General Geography (including Cosmography) are studied and, in the final year, Belgium and the Belgian Congo. The teaching of geography in secondary schools is limited to one period a week of 45–50 minutes except in the first year, which has two periods. Geographers with a University training are very few in numbers in Belgium, and therefore many of the teachers of geography are “self made,” or have learnt their geography only at the Training Colleges for primary or middle school teachers.

Miss Vincente de Carvalho (Brazil) reported briefly that in the elementary schools in Brazil the study of the homeland takes a dominant place. In the secondary schools a wider course is given; the syllabus is laid down by the State, but is subject to local modifications at the hands of individual teachers.

Dr. Wreford Watson reported control on a State basis in Canada. Geography used to be a four-year course taught by the science master, but recently it has been linked with history under the guise of social studies, and in many instances history and geography are taught in the same lesson. Each State adopts a standard textbook for the year and furnishes an additional list of books recommended for reading.

Mr. V. H. Shipman (Northern Rhodesia) reported the use of syllabuses drawn up by the government, which also adopts standard textbooks. A meeting of all specialists is however convened annually and their views are collected.

Miss E. B. Colborne (N.S.W., Australia) reported for her continent that teaching generally begins with the world background. In the

senior school there is emphasis on the study of land use and the growth of cities, which necessitates much research on the part of teachers and students, as there is no standard textbook available.

The symposium on *School Syllabuses* was confined rather to special topics. It was opened by Miss Phillips (Great Britain), who adopted as her line of approach a plea for the study of certain important topics on a world basis, inspired by the rapid technological and social changes that continually render our economic geography out of date. She suggested as topics for introduction into our syllabuses: (a) modern world transport; (b) world food, techniques of farming, pest control, and world surpluses; (c) the conservation of world resources, soils, minerals, forests, etc.; (d) a study of world population, its increase, the effects of nutrition and disease. As sources of information, much can be obtained from Colonial Office reports, United Nations reports and newspapers. She suggested that a half or whole term per year, or one lesson per week could well be devoted to this aspect of geography, even if it was done at the expense of regional studies.

Dr. J. H. Ringrose (Holland) made a plea for the wider exchange of school projects amongst schools in different countries, and described a project initiated in his school for pupils aged 12-14 under the title of "Focus on the Hague." It was instituted as a result of a suggestion made by the staff of a school in Southern California in order that the pupils in each area might be brought into closer contact with each other. The outline of the project was drawn up by form masters and had as its main theme "The Hague as a Seat of Government" and as its subsidiary theme "School Life in The Hague." A committee of children was chosen to work, with the advice of the teachers, and to issue working instructions to individual pupils who were allowed to express an option for the side of the project in which they were most interested. The synthesis resulted in an appreciation of the need for the correlation of subjects, and culminated in an exhibition of work that was open to the public. In the light of experience thus gained Mr. Ringrose expressed the hope that a system of international exchanges of school projects, between schools of different world regions, might be fostered.

Dr. Knübel concluded the symposium with a survey of syllabuses in Germany. He outlined the three types of school existent in the Western Zone of Germany: the *Volkschule*, *Realschule*, and *Gymnasium* and the geography syllabus within each. The elementary school concentrates on local geography, whereas the geography of Europe and the home country occupies five years in the secondary school. Pupils who leave school at the age of fifteen must attend school one day per week up to the age of eighteen.

The discussion on the treatment of *Local Geography* was opened by Dr. Briault (Great Britain), who emphasised the following points. There can be no uniformity in its treatment. It should be begun at

the age of eight and be interwoven with other subjects ; it represents the experience of the child himself, but such experience must be linked with his knowledge of other parts of the world. From the secondary stage onward it will have to compete with general world geography and is perhaps best treated in small doses in order to keep the world in perspective. Local geography does not mean necessarily the study of the school area but the detailed study of any small area, and for which the one inch map (or its equivalent) should provide the backbone. Beyond the age of fifteen local studies should be treated individually or by group study. In an urban area the study becomes more difficult and there is a tendency for it to wander off the main lines of geography. In rural areas, day excursions with an introductory lesson by the teacher and subsequent discussion, will act as the foundation. The method of study should be that employed in tackling bigger regions, for every region includes somebody's local region. Dr. Hickman (Great Britain) emphasised the value of excursions of varying duration. Dr. Knübel spoke of the importance that is attached to this aspect of geography in Germany ; it is taught for five years during a pupil's time at school, beginning at the elementary stage. Local studies are made both inside and outside the classroom and the assistance of non-specialist teachers is sought. Excursions of six days duration are made by entire forms, who stay at one of the "School Country Homes." One or two of the specialist staff are sent with the pupils and a complete study of the region is made in groups or teams which correlate their findings into a symposium. A real integration of subjects is thereby achieved.

Tendentious Matter in Atlases and Textbooks brought forward a lively exchange of views. Dr. Stöcker (Germany) opened the session by outlining the different methods of atlas production and made the suggestion that political maps should be included as a supplement to the atlas, instead of being incorporated in it, so that the present instability of frontiers should not so speedily make an atlas out of date. Much discussion centred round the spelling of place names and the teaching of their correct pronunciation to children. It was felt that where a foreign place-name is misrepresented in common usage and the press, the misrepresentation must stay, but that in atlases the correct spelling should be inserted additionally in brackets. There was also a suggestion that less common place-names should have a phonetic spelling in brackets. Delegates from Thailand supplied interesting comments at this stage of the discussion by reference to place-names in Thailand. Menam, for instance, is in fact the word in the Thai language for "river."

In discussions regarding textbooks it was generally agreed that the facts should be kept distinct from any commentary by the author, and the need for scrupulous care in the use in both texts and teaching of such terms as "native," was made evident from the critical

comments made by African delegates, with reference to the coloured peoples of the world.

The discussion on *Practical or Activity Geography* was opened by Miss Howells, H.M.I. (Great Britain) who considered the topic from the point of view of activity geography in the field and referred to this side of the subject as the child's attempt at "research." The environment should be explored on foot, with the one-inch map and children should be sent out to find objects which are indicated on the map. This should develop the study of all branches of the subject with the map used in the field, as the basis of the work. Map-making is equally of value, the plane table supplying the most useful method of making maps as the growth of the map can be seen in the field.

It was finally pointed out that the desire to pass examinations is a deterrent in some countries to the teaching of many forms of active geography. Mr. Honeybone (Great Britain) described activity geography in the classroom (as distinct from the field) as teaching children by actions and transferring the field techniques to the classroom. He outlined two methods to illustrate this principle. The first built up a revision of South Africa by emphasising the importance of gold in the economy of the country, beginning with export and import statistics from the *Statesman's Year Book*; the second considered the Japanese food problem by taking as a basis the budget of a Japanese farmer and a contoured map of his farm land. Reference was also made to the following points. The making of models should be encouraged, but can usually be done outside the normal geography lesson. Pictures are essential for many types of activity work, but must be carefully presented either for class discussion by means of the epidiascope, or for group discussion by wall pictures (with suitable questionnaires), or by individual work where each child has a picture and works out his own answers. Much can be done with the daily weather map particularly if each pupil is given a station to look after and the results are correlated.

Dr. Knübel stressed the prominent part already played by activity lessons in German schools and stated that there were special kinds of textbooks for these lessons which incorporated only pictures, statistics, maps and questions.

The final discussion, entitled *The Teaching of Geography and International Understanding*, was opened with an address by Professor Gordon East (Great Britain). He reminded us that geographers must, in the first place, teach the subject for its own value, so that, by creating a closer knowledge of the lives of other nations a better international understanding would automatically follow. The value of a special geographical course in International Understanding is doubtful as international decisions are made by governments and not by individuals. Geo-Politics, and its offspring—Geo-Pacifics, are subjects too dangerous to be tackled by young children. Most geo-

graphical problems (e.g., soil erosion) know no frontiers and can only be solved by international co-operation. Foreign travel is therefore of very great value to children at an age when their minds are flexible and responsive.

Among those who contributed to the subsequent discussion, the chief speaker was Dr. Wreford Watson who emphasised the danger of a modern tendency to magnify the local region and forget about the relationship to the world as a whole; this can lead to an insular and national outlook as typified in the teaching of geography in Canada in the 1930's. Any exercises that will widen children's horizons (such as the comparison of climographs or of the economic conditions of the homeland with those of contrasted world regions) should be made use of. He also felt that there was much to be said for the study of areas as cultural unities with the integration of geography, history and literature. The problem of the point of view of pupils in colonial territories where foreign policy may largely depend upon the wishes of the mother country, and the better understanding that might be achieved if pupils had some direct teaching about U.N.O. and U.N.E.S.C.O., were points that were also raised.

It was the good fortune of the Conference that the head of the German delegation should be Professor Brüning, the Director of the *Akademie für Raumpforschung und Landesplanung* in Hanover. Professor Brüning presented to the library of the Association a copy of the magnificent Atlas of Land Utilisation in Lower Saxony³, which has recently been published under his guidance, and the Association is much indebted to him for this valuable gift. He read to the conference a paper on Land Planning in Germany, with particular reference to Lower Saxony, and to the Atlas, which is a forerunner of a Land Utilisation Atlas to be prepared for the whole country. In this atlas the territory is divided into zones, with a series of maps for each zone on a scale of 1: 100,000, to show relief, soils, potential soil use, drainage possibilities, hydrography, minerals, and social and economic conditions. Professor Brüning emphasised that planning must consider the possibility of increasing the present agricultural land and creating new land in Lower Saxony by reclamation; an increase of 25 per cent in arable yield is desirable; towns must be reconstructed as factories are now trying to move back after their destruction. Twelve million refugees have to be resettled; the density of settlement in Lower Saxony having risen by 50 per cent. in the post-war years, many people must be moved into other zones or settled in different areas where they can follow their own trades, and thus reduce the enormous number of unemployed which now totals 1,300,000. In all this the land planner can be compared with a doctor who first makes the diagnosis by using his map; then he looks for the remedy by making new maps which will show the resources that have not

³ *Atlas Niedersachsen* 1950. Deutscher Planungsatlas, Band II, Bremen Walter Dorn. 1950.

been fully developed ; finally, he hopes to effect a cure by the production of his land-planning maps.

The conference closed with a discussion of ways and means whereby periodic international meetings might be organised to make possible the closer co-ordination of the work of teachers of geography in all parts of the world. The resolutions printed at the end of this report were approved for submission to corresponding societies in other countries, in the hope that, without incurring the burden of additional heavy costs, machinery might be devised whereby teachers of geography could benefit by closer international co-operation. The Honorary Secretary will welcome comments by members of this Association on the scheme put forward.

The whole conference was greatly indebted to the many speakers who came to Sheffield to address the meetings and to join in discussions. Particular thanks are due to Mr. A. J. Berrey who so ably assisted the Honorary Conference Secretary and acted as recorder for many of the meetings and to Miss M. Oughton, Assistant Secretary of the Association. To our old friend Mr. Cundall, a special word of thanks also is due for his successful efforts in arranging and leading an excursion to York that was greatly appreciated by the members participating and which was additional to the 500 miles included in the itineraries of the conference programme as planned.

Those who attended the meetings look forward to future opportunities to repeat a stimulating experience and renew valued international friendships.

Alice Garnett.

T. W. Brown.

PROJECTED UNION OF ASSOCIATIONS OF TEACHERS OF GEOGRAPHY

The following proposals were agreed upon by members attending the First International Conference of Teachers of Geography, at Sheffield, 30th July to 7th August, 1951, for submission to the various national associations of teachers of geography.

1. A union of Associations or Societies of teachers of geography shall be formed for the purpose of facilitating international exchanges and organising international conferences of teachers of geography.

2. Each Association shall appoint a foreign secretary who shall undertake the work associated with these activities and act as liaison officer for his Association. The foreign secretaries shall together form an international corresponding committee ; the Chairman of this committee shall be an additional member, nominated by the Association last holding an international conference, and taking office until the holding of the next conference. In countries where more than one Association have joined the union, one foreign secretary shall represent the country as a whole on the committee.

3. Conferences shall be convened by the Committee at suitable intervals. The first week in August is considered the most suitable period for the conferences, and the possibility of holding the next one in 1953 shall be explored.

4. The committee shall in addition do everything in its power to foster international co-operation amongst teachers of geography; e.g., it may assist in the exchange of school projects, school visits, local information of geographical interest and temporary exchanges of teachers, etc.

5. Each Association shall keep its members informed of the work of the international committee by circular letters to its members or by publishing a report in its journal, at least once a year.

6. There shall be no separate international annual subscription payable by members of the several Associations.

7. The Association issuing invitations for the holding of an international conference shall bear any losses or hold any profits that may arise in connection with the organisation of the conference.

8. Teachers of geography in countries within which their numbers are too few or scattered to make possible the organisation of a separate national Association may become overseas members of existing Associations and thereby participate in the scheme. (The Geographical Association of Great Britain already has a widespread and valued overseas membership.)

9. These recommendations shall be referred by delegates attending the present conference to their respective Associations, who shall report to the Honorary Secretary of the Geographical Association of Great Britain not later than 1st February, 1952. A resumé of the views expressed shall then be circulated to all Associations.

THE WORLD LAND USE SURVEY

J. CALLOW*

THE World Land Use Survey came into being on 1st January, 1951, with the establishment of the Old World divisional headquarters in London under the direction of Professor L. Dudley Stamp. Its history dates from the International Geographical Congress held in Lisbon in April, 1949, when Professor S. Van Valkenburg of Clark University, Massachusetts, proposed the institution of a "world-wide survey or inventory of land use." With the financial support of UNESCO a Commission was appointed to consider this proposal and met at Worcester, Massachusetts, in the following December and after several days of discussion issued a unanimous report. The

*Mr. Callow is Organising Secretary to the Old World Division of the Survey.

report, after emphasising the urgency of the world problems of population and food supply and the inadequacy of present information, pointed out that the collection of statistics could not replace the need for recording the facts on maps. It therefore advocated that a survey of land use in all parts of the world should be carried out, that the record should be strictly factual and objective, and that the results should be published in the form of maps and explanatory memoirs.

The members of the Commission drew up a "master key" of land-use categories which they regarded as being applicable to the whole world and careful notes were given on each category. It was stressed that each category could and should be sub-divided according to local needs, but in such a way that the main classification could be preserved and correlation thus permitted between one country and another. The main categories are: (1) settlements and associated non-agricultural land; (2) horticulture; (3) tree and other perennial crops; (4) cropland, (a) continual and rotation cropping, (b) land rotation; (5) improved permanent pasture; (6) unimproved grazing land; (7) woodlands (in six categories); (8) swamps and marshes; (9) unproductive land.

This necessarily brief outline of the history and objects of the World Land Use Survey† will indicate to the many readers of *Geography* who have had a personal share in the work of the Land Utilisation Survey of Britain that the present survey owes much to its British predecessor. Indeed, it has been said, somewhat lightheartedly no doubt, that the World Land Use Survey is merely an extension of the work of the L.U.S. However, although we can have no greater inspiration than the standards and usefulness of the work of the L.U.S., it must be admitted that the problems of organisation and procedure which will be met in carrying out a world survey are both different from and greater in many ways than those successfully solved by the British survey. The remainder of this article will be devoted to a consideration of some of these problems.

The Survey is at present merely a token force, a small unit whose function is to demonstrate the feasibility and usefulness of the project by producing sample land-use maps. It is believed that if a convincing demonstration can be made the necessary finances will be found. The moneys needed to establish international headquarters and to carry out the Survey in all parts of the world through the national committees will be very great, but even if these funds are forthcoming it is inconceivable that the Survey will itself be able to carry out geodetic and topographical surveying with the object of providing itself with base maps. The most that can be done is to produce land-use editions of suitable base maps which are now, or which may become available, and even with these limitations this is still an enormous programme.

† The Survey has published an explanatory leaflet which will gladly be sent to anyone writing to our offices in the Royal Geographical Society's House, Kensington, London, S.W.7. A recent article by Professor Stamp (*Nature*, Vol. 167, 1010—3) also describes the work of the Survey.

The lack of adequate base maps is probably the greatest single obstacle to be overcome in making a world survey of land-use; this lack, it will be appreciated, is greatest for just those very areas in which the work of the Survey should be of most value. The careful field by field record of the L.U.S. must be an ideal unattainable for the greater part of Europe, let alone the under-developed tropical areas; such methods require topographical maps at a scale of at least 1/25,000 which simply do not exist for most areas. The scale of 1/50,000 is perhaps the critical one for direct field-mapping without undesirable simplifications and generalisations and it is fortunate therefore that maps at about this scale exist for relatively much larger areas. Many European countries are mapped at this scale; India, Ceylon and Burma have a good coverage at 1/63,360; parts of south-east Asia (notably the more developed islands of Indonesia) are well mapped at 1/50,000, and this scale has been adopted by the Directorate of Colonial Surveys as the standard one for the mapping of British Colonies in Africa and elsewhere. However, the techniques of using the 1/50,000 scale map for land-use surveying in the field in Europe, to say nothing of the physically far more difficult environments of backward tropical areas, have by no means been fully evolved. One hardly dares think of the problems to be met in using smaller scale maps in the field, yet maps at scales of 1/250,000 and less—and old or otherwise unreliable maps at that—are all that exist for many areas. Finally, it must be remembered that for vast territories, such as the greater part of Angola, there are no suitable maps at all. The connection between under-development and map availability is obvious.

Given the base maps, given the funds and the personnel, there remains the problem of time. For our work to have something more than an academic interest it must be carried out in the shortest possible time consistent with accuracy, and in individual areas land-use surveys must be executed and results submitted before the formulation, or at least before the implementation, of development schemes. These schemes are an urgent necessity, so urgent apparently that the appalling risks of going ahead *without any detailed surveys of any kind* are not uncommonly taken. National committees must “sell” the idea of land-use surveys to their national planning bodies, and co-operate with them to ensure that priority is given to surveys of areas “scheduled for development.”

This problem of time cannot be solved simply on the basis of more funds and thus the engagement of more personnel. The expense would be impossibly great. Economy of time as well as of labour must be effected by the development and wide use of new techniques of land-use surveying, in particular the interpretation of aerial photographs with “control” supplied by preliminary field work carried out in carefully selected representative areas. Further, the use of these methods will hardly be a matter of choice since the nature of the terrain in most parts of tropical Africa and Asia is such that the

methods employed successfully in this country, in Europe and America are entirely out of the question. It might be said here that wherever possible land-use surveyors should seek co-operation with topographical surveyors since these latter already have in their possession vast amounts of land-use data and are themselves using techniques which we must adopt and develop for our own use.

A saving of time may also be effected by making maximum use of information already available. Some series of topographical maps such as the 1/50,000 series of Java are almost land-use maps in themselves.

It remains to indicate briefly what is being done towards the solution of these problems by the present organisation. The first task has been to investigate and record the literature and maps already published and relating to land-use studies. Secondly, we have sought to interest geographers either in groups or as individuals in carrying out field-surveying and research for us, since the financial difficulties do not allow us to do this for ourselves. There has so far been a very encouraging response from Britain and the Commonwealth, and from abroad. Thirdly, we have devoted considerable attention to mapping from aerial photographs. Through the kindness and interest of Brigadier M. Hotine, Director of Colonial Surveys, I have myself been given every facility for research work at his establishment. The work has been slow but the results promising. The area chosen was that immediately north and east of Zomba and four sheets at 1/50,000 scale have so far been compiled. Altogether nine categories of land-use together with six categories of intimately mixed land-use have been recognised without great difficulty within the area. It is emphasised that all that has been mapped is self-evident; going over the actual ground with the photographs in hand before mapping is undoubtedly essential for the production of a really accurate map displaying the maximum detail. As it is, final judgment of this work must await the opinion of the local Agricultural Department to whom copies are being sent. The fourth line of research is due mainly to the interest of Mr. F. George of the Royal Geographical Society. Through him, Mr. C. J. Richards, formerly a settlement officer in Burma, has set to and produced detailed 1:253,440 scale sheets of two Burmese districts, using as materials the information supplied on the 1-inch map, the detailed settlement reports and his own great personal knowledge of the districts. That this method represents a considerable saving of time by indicating where more detailed surveys would be valuable has been appreciated by E.C.A. whose representative, Dr. Jesse T. Sanders, recently spent several days with us prior to going on to Burma to carry out land-use and economic surveys. Dr. Sanders intends to base his work on the type of survey made by Mr. Richards, using the even more detailed material available in Burma.

In conclusion it may be said that we have now a good idea of what needs to be done and we have begun to see a little of how it might be done.

SOME NOTES ON THE GROWTH OF POPULATION IN THE CANNOCK CHASE COALFIELD

M. J. WISE*

THE present crisis in the British coal industry has focused attention upon the necessity for a detailed examination of social problems in the coalfields. Furthermore, as has been suggested recently by Professor Stamp,¹ geographers, for too long, have neglected the study of problems presented by the rapid growth and changing structure of the British population during the last two centuries. This is true not only in general, but in respect of the population of the coal mining districts.

The purpose of these notes is to outline some of the characteristic features of the population structure of the Cannock Chase coalfield, and to show that many of the present demographic problems in this area have their origin in the period of very rapid development of the coalfield after about 1850.²

The development of the coalfield. The physical characteristics of the coalfield and the story of the growth of coal mining have been discussed in detail elsewhere.³ The main stages of development may be summarised as follows:—

1. *Prior to 1840:* Mining, on a small scale, was confined to the areas of easiest mining conditions, *i.e.* where seams were exposed at the surface and free from the overlying drift, which, elsewhere in the coalfield, masked the seams to a variable, but often considerable, depth. Districts near Cheslyn Hay, Brownhills, Bloxwich and, in the north of the coalfield, at Beaudesert Park, near Brereton, had been worked, among others, since medieval times.
2. *Post-1840:* This was a period of intensive development in which coalmining spread throughout the entire exposed coal-

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¹ In his Presidential Address to the Geographical Association on January 4th, 1951, *Geography*, Vol. 36, 1951, pp. 11–12.

² The author's thanks are due to Professor R. H. Kinvig and to members of the technical staff of the Department of Geography in the University of Birmingham, particularly to Mr. D. W. Oliver. Acknowledgment should be made to Mr. G. S. Johnson and Mr. M. Cartwright, former students in the Department of Geography, with whom many of the points raised in these notes have been discussed. Fig. 4 is based in part on a map by Mr. Cartwright.

³ *Vide* "The Cannock Chase Region" in *Birmingham and its Regional Setting—a Scientific Survey* (1950) pp. 269–288, and "The South Staffordshire and Cannock Chase Coalfields and Future Planning" in *Conurbation* (1948) pp. 258–280.

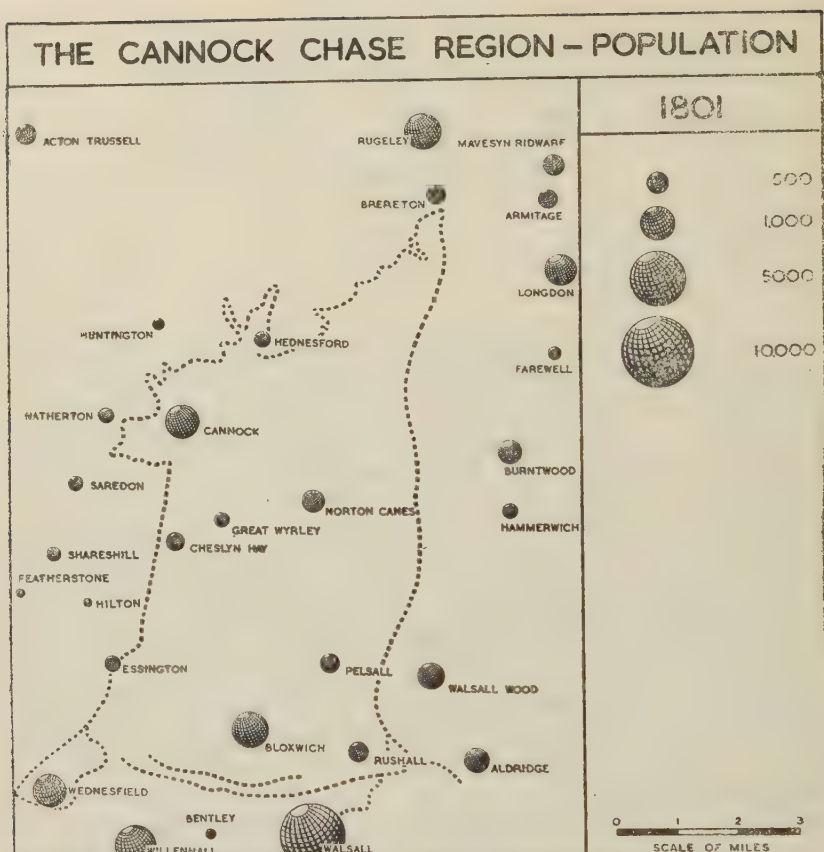


Fig. 1.

field, contrasting with the steady decline of mining in the Thick Coal areas of the nearby South Staffordshire coalfield.

3. More recently, and, in particular, *since 1900*, a marked feature has been the spread of mining into the concealed coalfield to the west and north-west. This has been balanced, however, by a great reduction of mining activity, due to exhaustion, in the southern part of the exposed coalfield, over much of which mining has now ceased completely.

THE GROWTH OF POPULATION

Population distribution in the early Nineteenth Century. Until the middle of the nineteenth century much of the coalfield remained an undeveloped heath. A wide tongue of unreclaimed heathland extended south-eastwards from the High Plateau of Cannock Chase through the Hednesford district to Norton Canes and Pelsall.⁴

Population was gathered in small settlements, often situated, as at Great Wyrley, on the edge of the waste, supplementing the income

⁴ *Birmingham and its Regional Setting*, pp. 274-7.

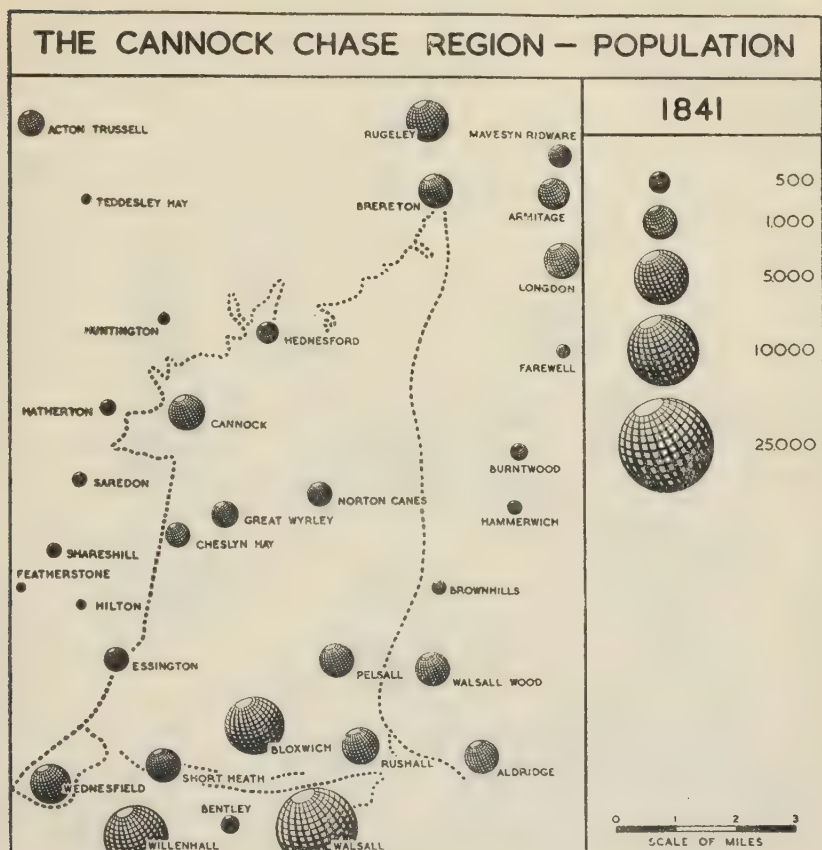


Fig. 2.

derived from mining by part-time work on local farms and small-holdings. In general, the distribution of settlements reflected the location of areas of relatively easy mining conditions. In the north, Brereton was the home of miners from the pits in the extreme northern tip of the coalfield around Beaudesert Park. Norton Canes, Cheslyn Hay, Pelsall and Essington were small mining centres. Local iron trades existed, in addition, at Cannock and Bloxwich.

Between 1801 and 1841 the growth of population and spread of settlement proceeded slowly over much of the coalfield. The chief exception lay in the south, where the spread of mining northwards across the Bentley Faults from the South Staffordshire coalfield had induced a more rapid rate of population increase, particularly after 1831. Thus Rushall grew very slowly from 485 in 1801 to 693 in 1831 but by 1841 the population had more than doubled to 1,609 and a period of rapid expansion had begun. A comparison of the distribution maps for 1801 and 1841 (Figs. 1 and 2) illustrates the more advanced position of districts in the southern part of the coalfield compared with

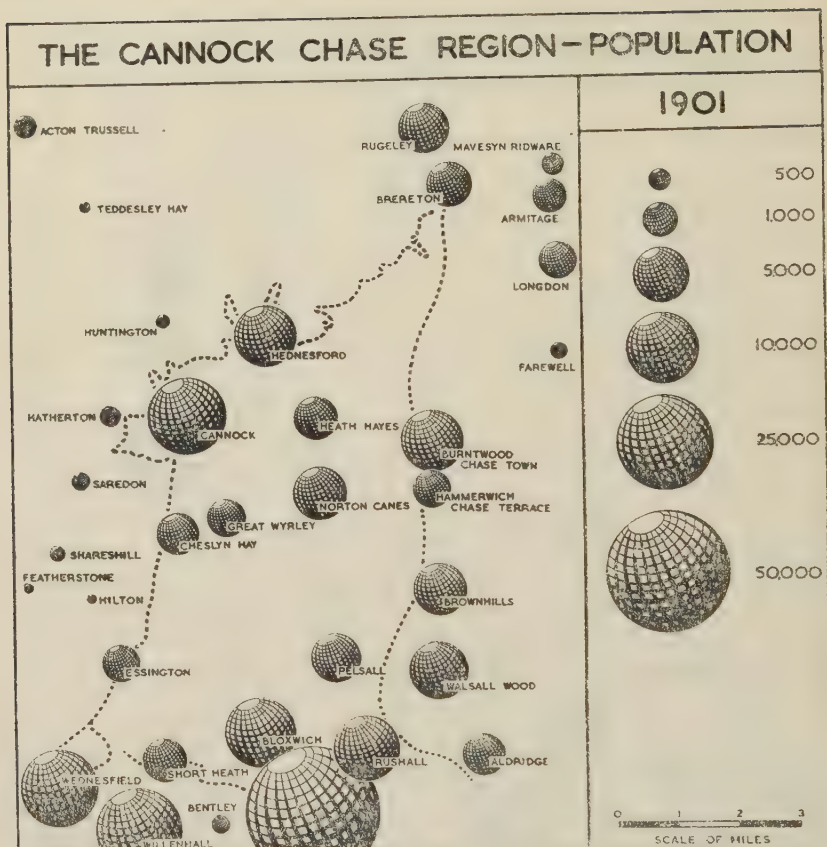


Fig. 3.

those of the centre and north. While Hednesford in the north showed very little change of population, Wednesfield increased from 1,088 in 1801 to 3,168 in 1841 and Pelsall from 477 to 1,026. The population graph (Fig. 5) makes it clear that a significant change in the rate of increase of population in the southern districts (of which Rushall is shown as an example) took place around 1831.

The growth of population in the post-1840 period. The rapid growth in all sectors of the exposed coalfield is clearly shown by a comparison of the distribution maps for 1841 and 1901. In the southern sector, continued growth in Walsall and Bloxwich was associated with the development of the iron and leather trades as well as of mining. Walsall lay just beyond the eastern boundary of the South Staffordshire coalfield, and though mining was important it was by no means the primary occupation. The rates of growth of settlements in the southern district, during this period, were by no means as great, however, as those of mining towns in the central and northern sectors. This can be clearly shown from the graph (Fig. 5). Good examples from the central sector

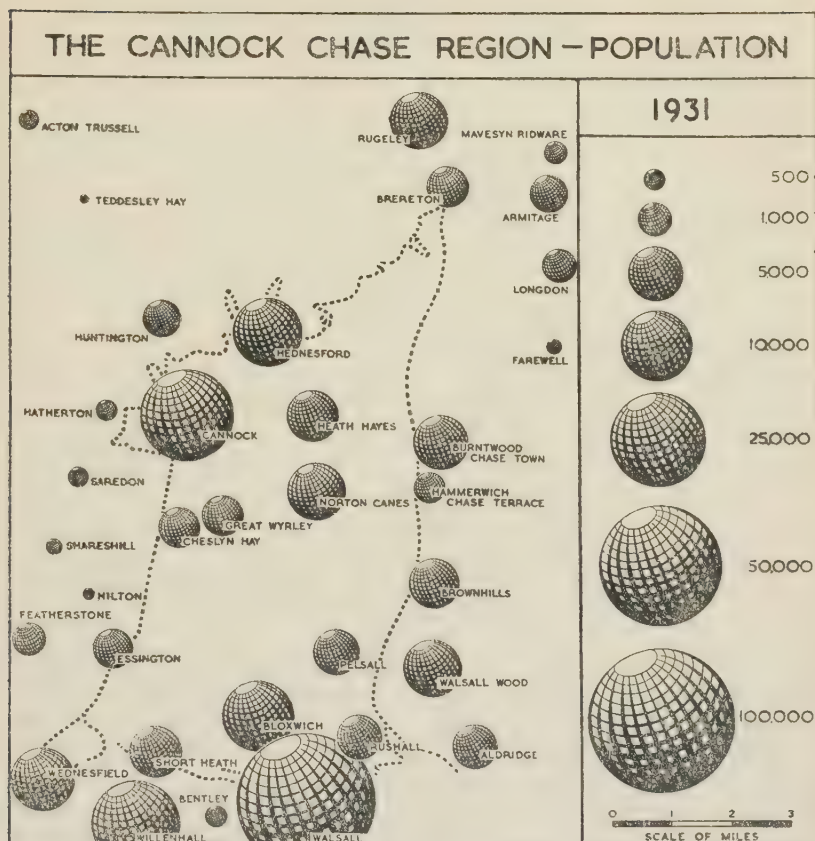


Fig. 4.

are provided by Chase Town in the parish of Burntwood, which developed quickly after the mid-century as a newly founded and purely mining settlement. Chase Terrace also was a newly founded mining village. The growth of these mining settlements was quickly reflected in the population totals for their respective parishes, Burntwood increasing from 781 in 1851 to 8,195 in 1901 and Hammerwich, from 270 to 1,573 in 1891. Similarly Cannock parish grew rapidly from 3,081 in 1851 to no less than 26,012 in 1901. Within Cannock parish a marked feature was the development of subsidiary settlements such as Heath Hayes, which was non-existent before 1801, and Hednesford which developed from a small hamlet providing local staging services for travellers into an active mining settlement numbering over 8,000 by 1901.

The rapidity of growth of these towns of the central and northern sectors during the latter part of the century is apparent from Fig. 5.

The growth of population since 1900. Two phases in the growth of population have been discussed already. The earliest after 1831 included the growth of towns in the southern district. After 1841 the

CANNOCK CHASE COALFIELD COMPARATIVE RATES OF POPULATION INCREASE IN SELECTED PARISHES

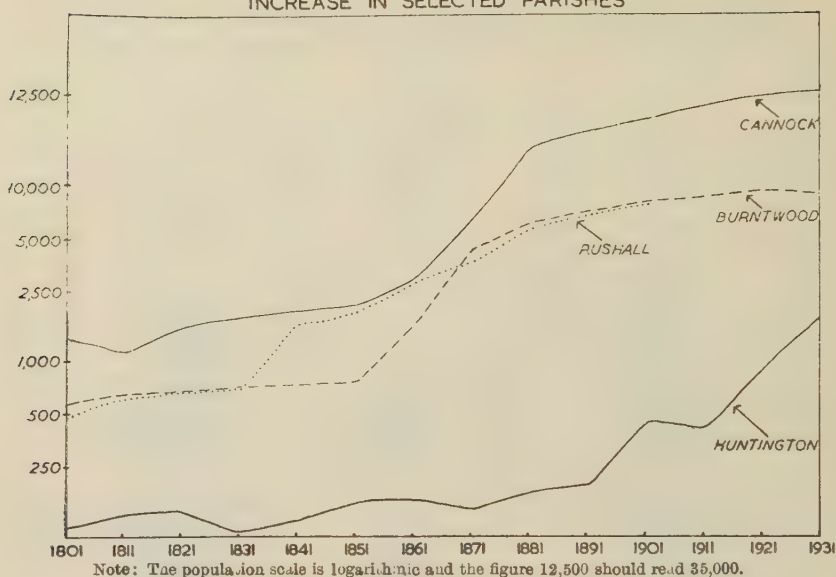


Fig. 5.

rate of population growth in the centre and north of the coalfield increased rapidly. The further spread of mining since 1901, on to the concealed coalfield, has been reflected in a third phase of population growth. This, though smaller than either of those already discussed, has resulted in the growth of new mining settlements of which the most interesting is Huntington. This village, which serves the nearby Littleton colliery, has grown from 300 in 1911 to 1,816 in 1931. A similar development, from 39 in 1921 to 1,058 in 1931, occurred in the parish of Featherstone due to the sinking of the large Hilton Main Colliery in 1924 (Figs. 3 and 4).

The decline of coalworking in the south and south centre of the coalfield, which has been characteristic of this period, has not resulted in any marked decline of population totals, though, as will be seen from Fig. 5, once the maximum period of mining development was over, population rates of increase slackened rapidly. That population totals have been maintained in the worked-out parts of the coalfield is due to two causes. Miners have been able, without travelling inordinately long distances, to find employment in the more prosperous areas to the north, while the factories and offices of the Black Country to the south have provided a large and fairly constant demand for labour.

POPULATION STRUCTURE

One of the most interesting features of the distribution of population in this coalfield is shown on Fig. 6. In common with many other coalfields,⁵ Cannock Chase exhibited in 1931 a marked deficiency of females.

⁵ See, for example, the population map of the South Wales coalfield in T. Alwyn Lloyd and Herbert Jackson, *South Wales Outline Plan* (1949), p. 58.

In the Midlands I Region of the 1931 census, including the four counties of Shropshire, Staffordshire, Warwickshire and Worcestershire, an overall ratio existed of 1,074 females to 1,000 males.⁶ For the County of Staffordshire the ratio was 1,038. To this situation, the Cannock Chase coalfield presented an almost complete contrast. In examining the position in this coalfield three districts emerge.

1. In the southern half of the coalfield, including such parishes as Rushall and Essington, the deficiency of females existed but to not quite the same degree as in the central and northern sectors. Essington and Pelsall possessed ratios of, respectively, 90.5 and 90.0 females to every 100 males. In the transitional area between the Cannock Chase and South Staffordshire coalfield, where Short Heath, for example, possessed a ratio of 98.4 per 100 males, the deficiency was reduced, while, in the Black Country itself, in Willenhall, Darlaston and Walsall, the ratio assumed almost normal proportions. It will be remembered that the southern portion of the coalfield was almost worked out by 1931, and this area has come increasingly under the immediate sphere of influence of the Black Country Conurbation.

2. In the central sectors of the coalfield, as, for example, in Cannock, the deficiency of females became still more marked. The Cannock ratio was 88.1 females per 100 males; for Cheslyn Hay the figure was 88.6. This district is roughly comparable with the area of the central and northern sectors of the exposed coalfield, which are still worked actively. It is interesting to note that, in the east of the coalfield, Burntwood and Hammerwich, which include the almost purely mining settlements of Chase Town and Chase Terrace, did not exhibit the deficiency of females to quite the same very marked degree, but it must be remembered that these parishes include also much rural country and some non-mining settlements.

3. The third group of parishes included those areas associated with the twentieth century spread of mining on to the western concealed coalfield and, here, Huntington, for example, had a ratio of only 84.9 females to every 100 males.

The rural parishes and service centres around, but away from, the coalfield exhibited ratios comparable, or in some cases slightly in excess of, that for the Administrative County. Penkridge, for example, had a ratio of 106.3, while the comparable figure for Lichfield M.B. was 108.6.

It is unfortunate that population statistics for the period since 1931 do not yet make possible a completely full examination of trends up to the present day. General indications, from the estimates of 1939, were that the position was somewhat improved. The general ratio for Brownhills, for instance, had improved from about 91.0 females per 100 males in 1931 to 97.06 in 1939, a figure which was still below the county average. The two sets of figures are not in all cases, however,

⁶ This compared with a ratio of 1,088 females to 1,000 males for the United Kingdom as a whole.

CANNOCK CHASE SEX DISTRIBUTION 1931

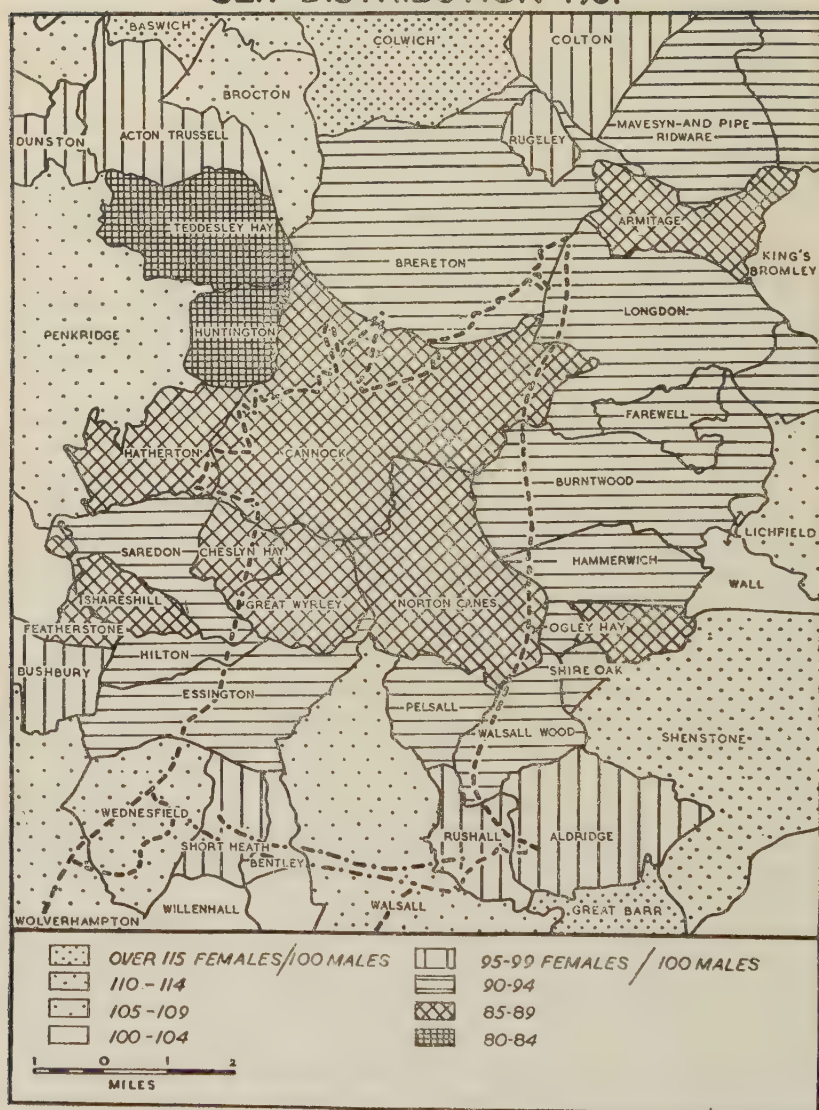


Fig. 6.

strictly comparable. The Registrar General's estimates for 1947 provide a ratio for Brownhills U.D. of 101.1 females to 100 males which suggests a considerable alleviation of the problem⁷, but it must be

⁷ *Estimates of the Sex and Age Distribution of the Civilian Population 1947* (H.M.S.O. 1949). The estimates of 1947 and 1939 are not strictly comparable with the 1931 Census. In the instances shown the figures quoted may be taken to indicate general trends only.

remembered that these figures do not include the number of males absent on service in H.M. Forces. Corrected estimates suggest a ratio slightly above that for 1939 but one still well below the county average. In Cannock U.D. the ratio according to the 1947 estimates was 95.3 compared with 93.8 for the 1939 estimate and about 88 for 1931. Allowing for a correction for the absence of young males on national service, this suggests that there has been little change in the position in Cannock since the immediate pre-war period. Among other areas, Cannock R.D., which includes a large part of the northern and central mining districts, possessed a ratio well below average.

It will be clearly seen that a marked deficiency of females has been and, to some extent, is still, a marked feature of the population pattern of this coalfield.⁸

The problem becomes of even more interest when pursued into the question of age distribution. The total deficiency of females, as Fig. 5. makes plain, is due principally to a marked absence of girls in the 15-24 age groups. In fact, in Cannock U.D. for 1931 only 2,213 girls were included in those age groups compared with 3,338 men. Two possible causes may have contributed to this feature. Either the balance of the male/female totals has been upset by an immigration of young males into the coalfield, or, alternatively, the absence of females in the age groups mentioned is due to a migration from the area. In the case of Cannock U.D. for 1931 the latter explanation is undoubtedly the chief one. As will emerge later, social and industrial conditions have combined to make the coalfield an unattractive place for girls, once the school-leaving age has been reached and a migration from the area of girls in the 15-19 age groups ensues. It is interesting to note that in the 25-34 age groups the deficiency of females is smaller and this may possibly be due to the fact that many women return to the district either to marry or, having failed to marry in their migration areas, to return to the parental home. Whereas, in the nineteenth century, domestic service provided a consistent demand, in areas outside the coalfield, for young girls, the majority now seek employment in the shops, offices and factories of nearby large towns and especially Birmingham. In this connection a migration into Birmingham of girls in the 15-24 age groups has been noted, coupled with a movement outwards and back to their home areas of women over 30.⁹

It can be argued that, in some coalfields, the difference in the respective totals of males and females is to be accounted for not only by the

⁸ Since these notes were written, the 1951 Census has been taken and a *Preliminary Report* published, (H.M.S.O. 1951). Though detailed figures are not yet available, the preliminary figures reveal that the ratio of females to males is still below the county average (1,037 : 1,000) and far below the ratio for England and Wales (1,081 : 1,000).

The notes to the *Preliminary Report* (p. xxiii) contain some interesting remarks on the national distribution of the sexes, and it is hoped that some further observations on this distribution will be published when more detailed figures are available from the Census reports.

⁹ W. Taylor, *Migration in Birmingham, 1931-47* in *Birmingham and its Regional Setting*, pp. 264-5.

emigration of young women but also, particularly in earlier periods of coalfield development, by the immigration of young men in search of work. In the Cannock Chase coalfield, this latter explanation is undoubtedly of only secondary importance and finds little support from a study of the age and sex structure of the population in any period except, possibly, that of the initial development of the coalfield.

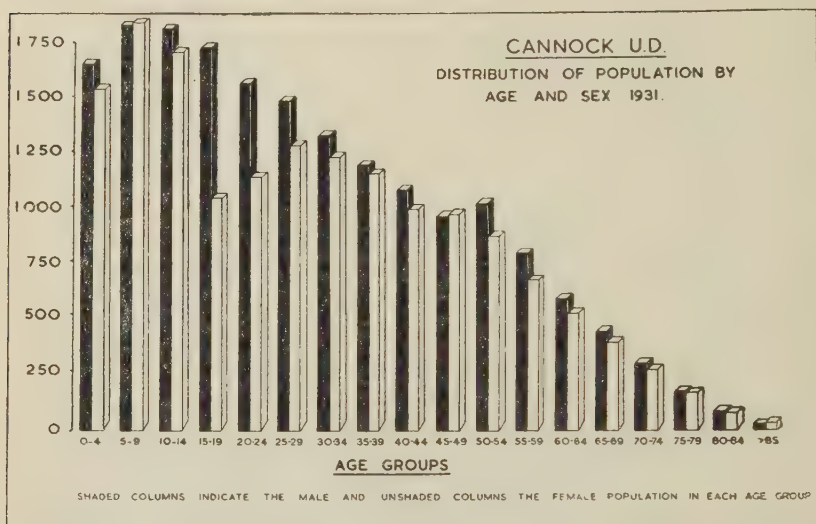


Fig. 7.

It is true that a certain immigration of young men into the coalfield has been noticeable in periods of high demand for coal. The Cannock Chase coalfield provided, in the pre-1939 period, one of the most extreme examples of the seasonal coal trade in the country, the peak demand for the household and general industrial coal occurring in the winter months.¹⁰ The actual totals of young men recorded may, then, vary, but to only a very limited extent, according to the time of year at which the count was made. On the other hand, the emigration of women presented no such seasonal features.

In an attempt to examine the question historically, diagrams similar to Fig. 7 have been prepared for earlier periods in the development of the coalfield, as far as the statistical records allow. In the early period of development of the coalfield a number of the immigrants were young, unattached men, but it has not yet been possible to obtain a quantitative estimate of this immigration for the whole coalfield.¹¹ The acute deficiency of females in the 15-24 age groups, due to emigration, seems to have developed, however, once the period of maximum rate of in-

¹⁰ *First Report of the Departmental Committee on the Eight-Hour Working Day in Coal Mines*, Pt. III (1907), p. 72 et seq.

¹¹ Considerable information for the study of these problems in other coalfields will be found in the *Census Reports* and in the *Annual Reports of the Registrar-General*.

THE CANNOCK CHASE REGION
SETTLEMENT PATTERN

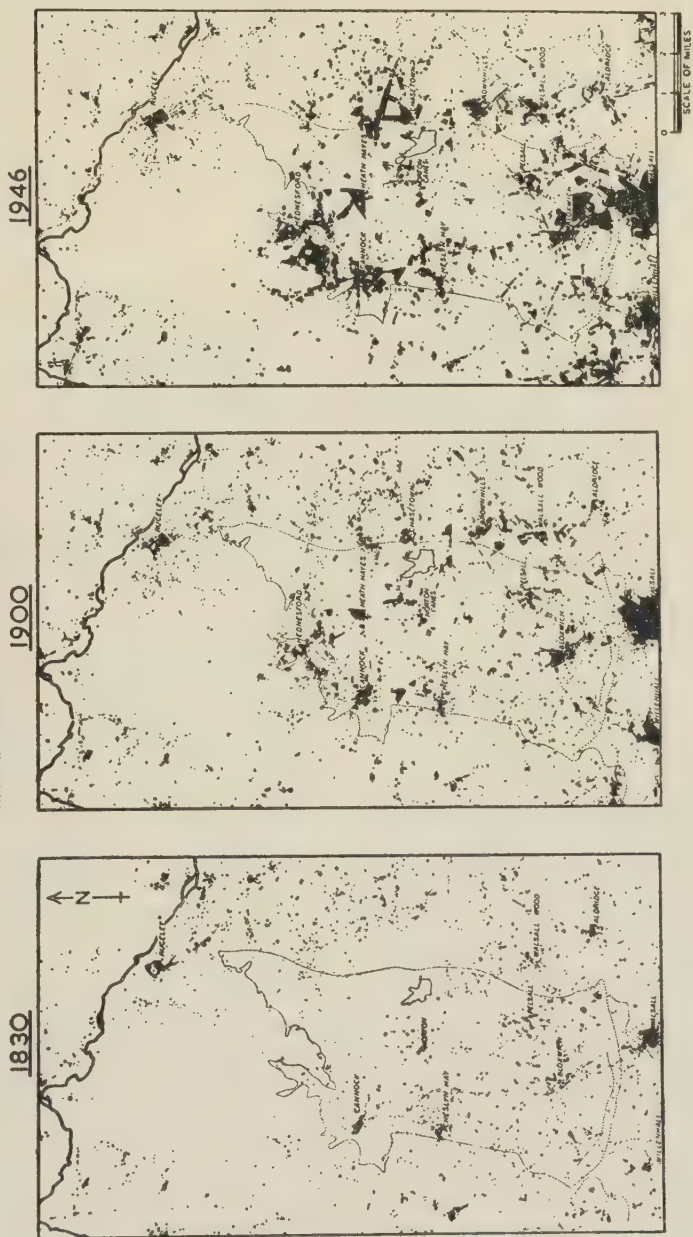


Fig. 8.

crease of population was over. Then, as now, the coalfield provided few opportunities for employment to girls leaving school and migration in search of work became a common feature. This feature of the population structure was certainly well developed by 1881 and the Census report of that year¹² indicated that the very high proportion of males to females in Staffordshire was due to the presence of mining. Similar conditions prevailed also in other coalfields, notably in Durham, Derbyshire and South Wales. They had existed also at an earlier period in the South Staffordshire coalfield, for the 1841 Census indicated a marked deficiency of women in many parishes which depended largely on the coal and iron trades.

In assessing the causes for the relative deficiency of women in this coalfield, the emigration of young women in the 15-24 age group, in search of employment elsewhere, must be given first place.

It is not possible to enter into more detail here but it is suggested that the movements and structure of population to and in the coalfields in the nineteenth and present centuries is a subject which might well engage the future attention of geographers.

THE GROWTH OF SETTLEMENT AND INDUSTRY

It has been shown that, among the factors responsible for the social problems of this area, the character of the settlements and the almost complete dependence on coalmining are chief. Fig. 8 demonstrates the rapid growth of mining towns and villages. In 1830 lines of cottages were spreading along the roads of the southern sector of the coalfield. Groups of houses were gathered around newly sunk collieries. Tracts of heathland occupied the north and north-east. By the end of the century, many new towns had emerged and the basis of the present pattern was in existence over the whole of the exposed coalfield. Hednesford and Heath Hayes were purely mining towns. On the eastern margin Chase Town and Chase Terrace grew quickly, in ugly, long lines of miners' terrace houses. These are well represented in the 1946 map. Quite apart from the ugliness of many of these townships, their characteristic linear development has not made for social cohesion. Services and amenities were often lacking. Observers at the end of the century found much to criticise in the social environment provided by these settlements. "They possess so little that is attractive, they are ill-built and ill-kept; their very architecture is depressing; they present nothing to elevate or refine, either in the nature of the industry, or in the environments of the people's daily life."¹³ Though many improvements have been made, the inadequacy of the social services has recently been re-demonstrated by the Report of the West Midland Plan. "With the exception of parts of the Black Country," these towns, it is said, "have the poorest social facilities of any part of the West Midlands."¹⁴ The social environment is, then, one which hardly

¹² Vol. 4, p. 16.

¹³ F. W. Hackwood. *Chronicles of Cannock Chase* (1903).

¹⁴ Abercrombie and Jackson. *West Midland Plan*. Advance edition (1948). Vol. III.

CANNOCK CHASE INSURED POPULATION BY INDUSTRIAL GROUPS 1947

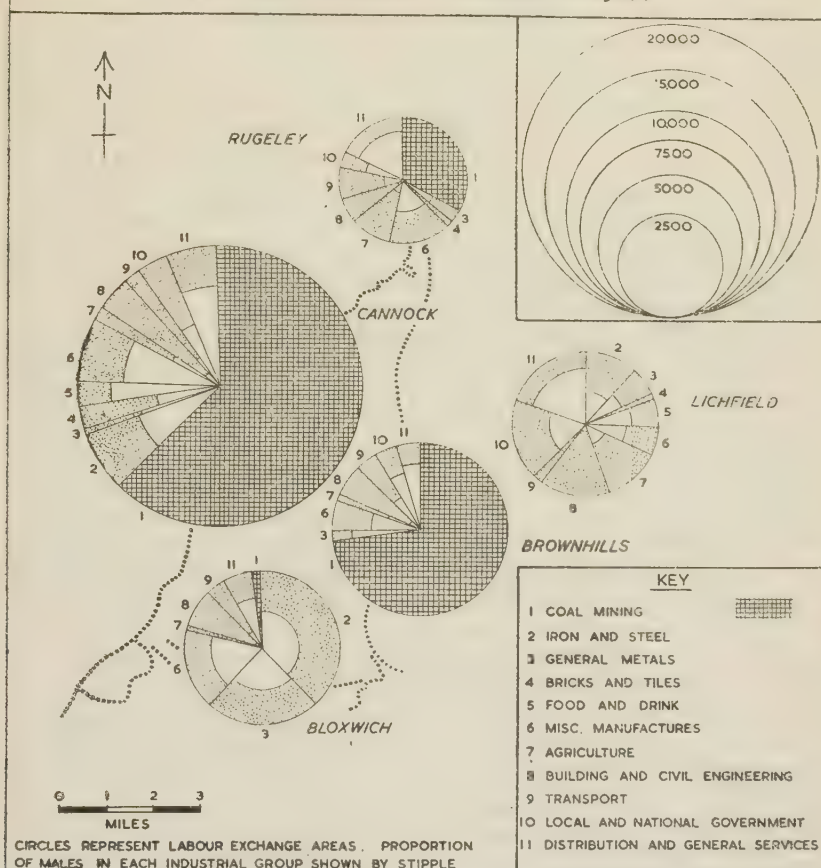


Fig. 9.

encourages the development of any but a monotonous class structure and a lack of balance within the population.

This is, unfortunately, intensified by the industrial structure. Cannock Chase has never developed, to any large degree, industries other than coal mining. Cannock coal is non-, or only very weakly, caking. Reserves of iron ore were small and, for the most part, of poor quality. Furthermore, the Cannock coalfield was developed only after the coming of the railways had finally confirmed the location of heavy industry in the Black Country to the south. Small enterprises engaged chiefly in the iron trade did and do maintain themselves in, for example, Cannock but attempts to introduce a heavy iron industry were few and only temporarily successful. In particular, few industrial enterprises have been introduced to provide suitable employment for the un-

employed female element in the population. Service industries, which usually provide suitable occupations for young women, have always been and are still inadequate.

The 1947 position, which is shown in Fig. 9, represents a considerable improvement in this respect over the pre-1939 period, due to the introduction of some light industries and the development of local and national government services in the coalfield. Even so, the pre-dominance of coalmining is obvious in the Cannock and Brownhills labour exchange areas. In Brownhills, for example, 72.6 per cent. of the total, and almost 80 per cent. of the male, insured population were engaged in coalmining. A marked contrast occurs between Brownhills where women form barely 9 per cent of the total insured population and the area of Lichfield, a local market and distributive centre in the Trent Valley away from the coalfield, where women form 27.6 per cent.

In the southern sector of the coalfield mining has now ceased to be an occupation of prime importance and here the principal part of the insured population is engaged in the steel and other metal industries of the northern part of the Black Country, which have spread also into the extreme south of the now worked-out southern sector of the Cannock Chase coalfield. These are more properly related to industrial development in the Black Country than to the coalfield.

The industry map serves to emphasise, once again, the division of the Cannock Chase coalfield into the abandoned southern sector and the still active central and northern areas.¹⁵ More and more, people in the towns of the south, such as Bloxwich, Rushall and Pelsall, look southwards towards the Birmingham-Black Country Conurbation for employment, services and amenities.

The Cannock Chase coalfield presents, then, an unsatisfactory social and demographic environment. The coal industry offered, in pre-1939 years, irregular employment due to the fluctuating seasonal demand for house coal. Over-dependence on coalmining has led both to the immigration of young, unattached men at periods of demand for coal and to the emigration of girls and young women in search of employment in a happier environment.

The results of a century of unplanned development are only too apparent. It is not too much to say that the future prosperity of British coalfields depends in a large measure upon the development of settlements comprising mixed communities, engaged not only in mining but in other carefully introduced industries, and with a balanced population structure, as well as upon the careful replanning and rehabilitation of the cultural landscape.

¹⁵ See also *Birmingham and its Regional Setting*, pp. 286-8.

THE DISTRIBUTION AND LOCATION OF STEAM-DRIVEN POWER STATIONS IN GREAT BRITAIN

E. M. RAWSTRON*

MOST of the electricity consumed in Great Britain is generated at steam-driven¹ power stations owned and operated by the public electricity authorities.² A relatively small but increasing amount is derived from water power, and smaller quantities still from diesel plants, waste-heat, gas and producer gas. On the Thames the new Bankside Station will use oil furnaces (it will be the only important station in the country to do so), and three fifteen megawatt sets, at Dundee, Dunston-on-Tyne, and Manchester, are being set up experimentally to use gas-turbines.

Fig. 1 is a distribution map of coal-driven generating stations operated by the British Electricity Authority for public supply.³ The stations are shown by symbols proportional to their capacity,⁴ but the few with under one megawatt are omitted.⁵

There are six major groups of stations. (Fig. 1).

1. The London area.
2. South Wales and Bristol.
3. The Midlands.
4. The West Riding and South Lancashire.
5. North-east England.
6. Central Scotland.

The stations within these areas contain most of the generating capacity of the country, while the remaining stations give rise to a

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¹ *Ministry of Fuel and Power Statistical Digest 1948 and 1949*, Table 85. 97.3 per cent. of the electricity generated by the public supply authorities is derived from steam-driven plant.

² The British Electricity Authority and the North of Scotland Hydro-Electric Board. A survey of the growth of the Electricity Supply Industry in Great Britain is given in the unpublished thesis "A Geographical Study of Electricity Supply in the North-West Region," by T. H. King, M.A., lately of Liverpool University.

³ The maps in this paper are prepared from data in *Garcke's Manual*, 1948-49, and the *First Report of the British Electricity Authority*, 1949.

⁴ The installed capacity of a generating station is measured in watts (W), one kilowatt (kW) being one thousand watts and one megawatt (mW) being one million watts. A station with a capacity of one megawatt could theoretically sustain an output equal to the continuous consumption of 10,000 hundred-watt lamps. The output of a generating station is measured in kilowatt-hours (kWh). One kilowatt-hour is equivalent to one unit of electricity and a station with a capacity of one megawatt could therefore theoretically produce $1,000 \times 8,760 = 8,760,000$ units in a year.

⁵ The stations at Aberdeen (54.6 mW installed capacity) and Dundee (69.625 mW installed capacity) are also omitted for the sake of convenience in reduction.

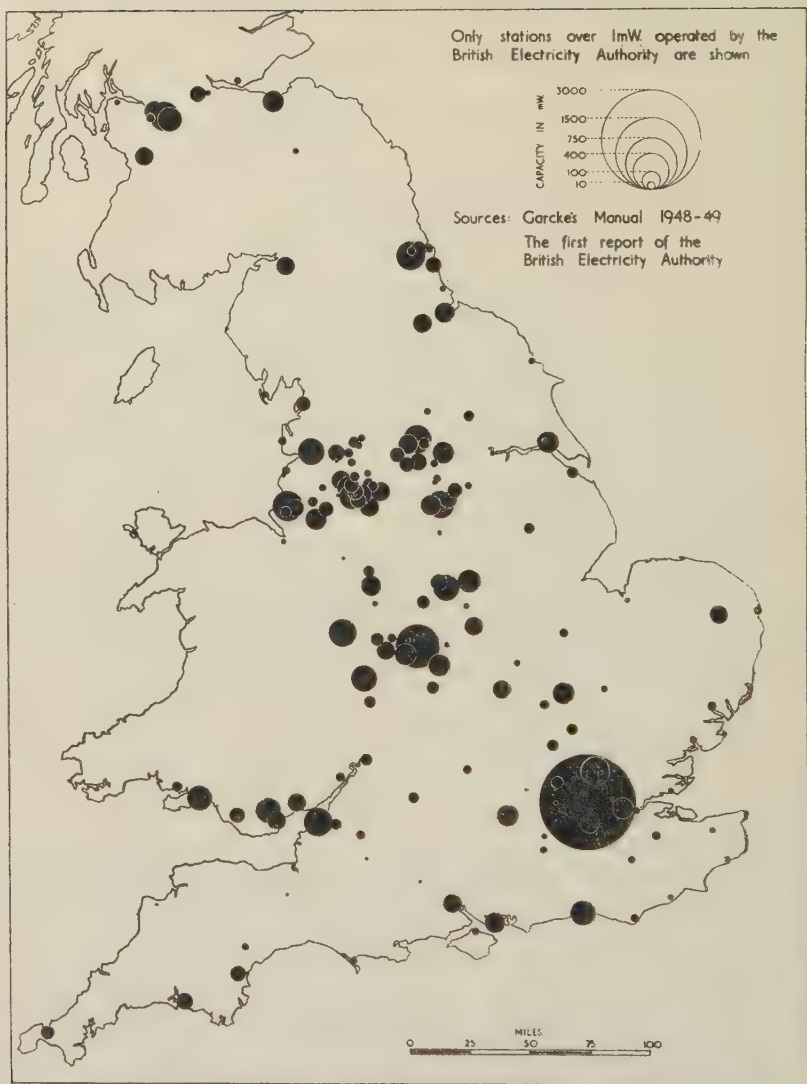


Fig. 1.—Coal-driven Electricity Generating Stations. Capacity in 1948.

N.B.—The large symbol for London represents the total capacity of all coal-driven stations in the London Division of the British Electricity Authority.

scattered distribution of medium-size and small plants especially in the east and south.

Electricity is produced to satisfy the demand from domestic and industrial consumers in the main, so one might reasonably expect to find a degree of similarity between the relative density of population and industry, and the distribution of power stations. Indeed the six groups of stations conform broadly, but not always in detail, to the major concentrations of population. London, for example, is clearly

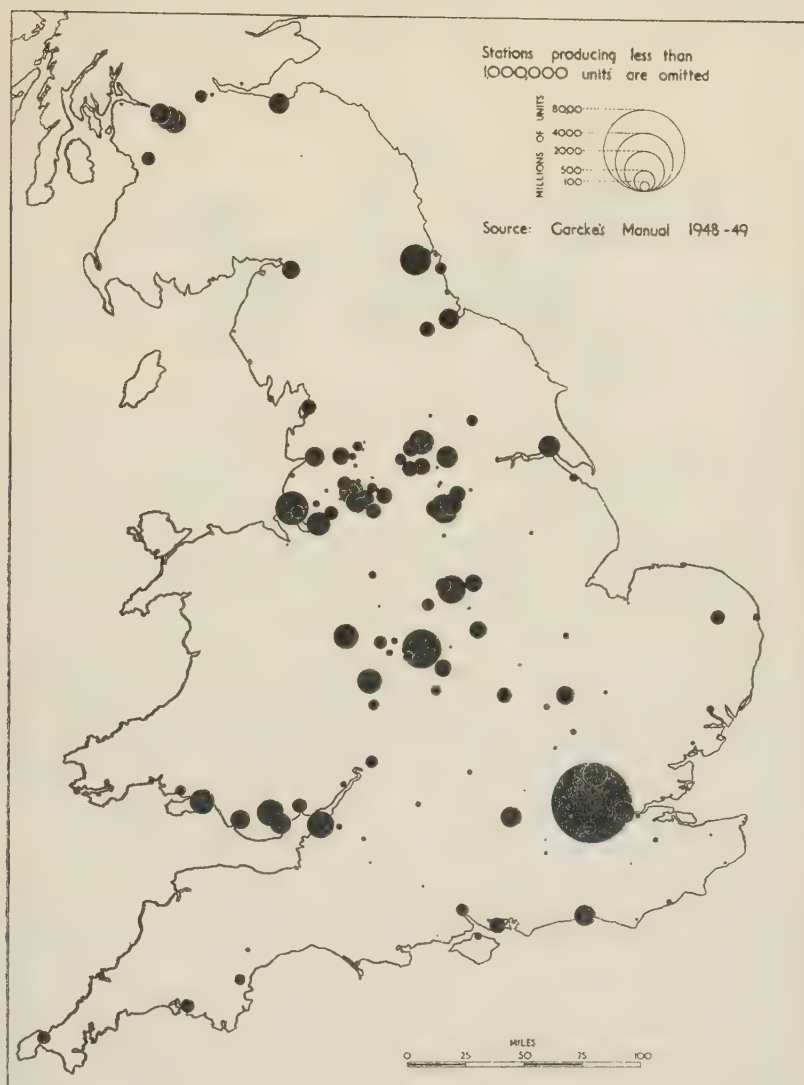


Fig. 2.—Coal-driven Electricity Generating Stations. Output in 1946-47.

N.B.—The large symbol for London represents the total output of all coal-driven stations in the London Division of the British Electricity Authority.

marked, but it is as well to note that 70 per cent. of the installed capacity of the Metropolitan area (Fig. 3) and 84 per cent. of the output (Fig. 4) are on Thames-side.⁶ In South Wales the populous mining valleys are devoid of any large stations, which are either in the major ports or near the coast at a convergence of valleys. The Midland group of stations shows a distribution pattern markedly different from that

⁶ See also Harris, C. D. 'Electricity Generation in London, England.' *Geographical Review*, vol. 31, 1941, pp. 127-134.

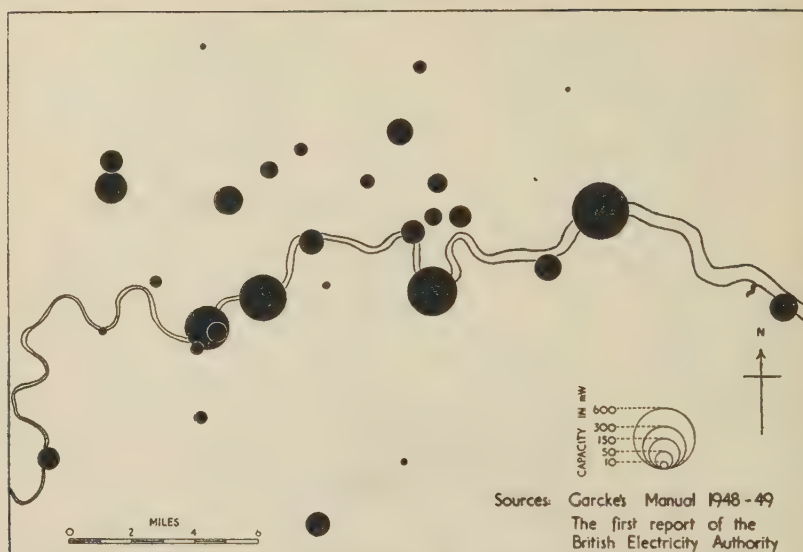


Fig. 3.—Coal-driven Electricity Generating Stations in the London Area.
Capacity in 1948.

of the major urban centres, since the largest and most productive plants in the west Midlands (Hams Hall nine miles east of Birmingham, Meaford six miles south of Stoke, Ironbridge, and Stourport on the Severn) have no counterparts in the urban distribution.⁷ In the east Midlands there is a much closer correspondence, but the densely peopled belt between Nottingham and Derby in the south, and Sheffield in the north, possesses no major power station at present.

In Lancashire and the West Riding the distribution of generating stations closely resembles the urban pattern, but there are some differences. The stations at Preston, Runcorn and in the Sheffield district are some of the exceptional cases. Preston and Runcorn possess larger stations than their respective populations would seem to warrant and the concentration of stations near Sheffield from Neepsend to Mexborough is not coincident with the urban grouping in south Yorkshire.

In North-east England and in Central Scotland the urban pattern and the power station pattern are broadly coincident.

A number of reasons may be suggested for some of the more marked differences between the distribution of power stations and the distribution of the major concentrations of population.

1. The demand for electricity does not vary in direct proportion with the number of consumers (cf. Table I).

2. It has long been the policy of the electricity authorities to attempt to concentrate generation in a small number of large and efficient stations.

⁷ Cf. *Population of Urban Areas*, Ordnance Survey, 1/625,000, 1945.

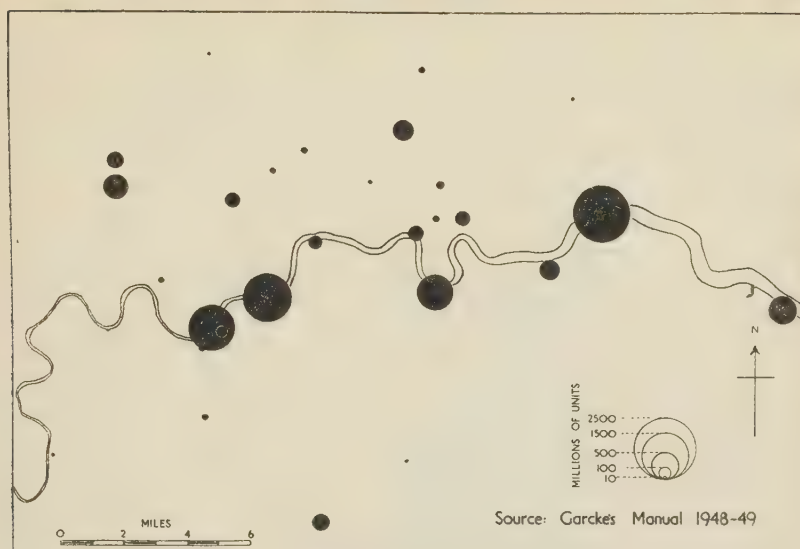


Fig. 4.—Coal-driven Electricity Generating Stations in the London Area.
Output in 1946-47.

3. The distribution of privately owned power plants of whatever kind is bound to affect the distribution of public sources of supply since it reduces the potential demand for current ; but there are no statistics to make possible a thorough investigation of this point.

4. All populous areas do not possess the appropriate siting facilities for the establishment of large power stations.

TABLE I

Authority	Number of Consumers	Units Sold			Units sold per consumer
		Lighting, Heating & Cooking	Power	Total	
Bournemouth ..	74,551	100,447,000	35,848,000	139,405,000	1,870
Stoke-on-Trent	75,885	76,360,000	133,890,000	211,259,000	2,784
Coventry	74,385	111,090,000	224,772,000	336,223,000	4,520
Brighton	58,304	103,253,000	20,746,000	130,844,000	2,244
Derby	58,015	98,247,000	57,978,000	164,648,000	2,838
Leeds	155,761	202,823,000	153,496,000	394,761,000	2,534
Sheffield	172,054	247,607,000	559,392,000	881,777,000	5,125

Data for year ended 31st March, 1948.

Source : Ministry of Fuel and Power, *Electricity Supply 1947-48 Return of Engineering and Financial Statistics Relating to Authorised Undertakers*.

The lack of suitable sites and the fact that coalmining, which provides its own power, is the major industry in the valleys of South

Wales account to a great extent for the absence of large power stations from the coalmining area. In the west Midlands suitable sites near the load centres in Birmingham, Wolverhampton, Walsall and Tipton were early occupied, and subsequent increases in the demand for electricity had to be met by the construction of stations not on the Birmingham Plateau itself but on its margins where land was cheaper and water supplies more plentiful.

The distribution of power stations in the densely peopled belt extending from Sheffield through Mexborough to Barnsley is especially influenced by the distribution of industrial activity. Between Mexborough and Barnsley the major activity is coalmining and consequently there is a proportionately lower demand for power from public sources of supply. In the Don valley on the other hand, notwithstanding a substantial output of electricity at some of the steel works, far larger amounts of current are purchased from public sources to satisfy the very heavy demand from the steel industry in general and especially from the electric furnaces in the district. In 1948 there were 192 electric furnaces in Britain of which Sheffield and its immediate neighbourhood possessed 102.⁸ (Cf. Table I. Note the high power consumption in Sheffield itself).

Notwithstanding these local differences, it remains true that in general the distribution of power stations in Britain can be related closely to the distribution of urban centres or urban groups, but that a strict coincidence does not necessarily occur.

Fig. 2 shows the actual output of all those stations which produced more than one million units in 1946-47. In comparison with Fig. 1 some of the stations appear smaller and others larger.⁹ All the stations in Birmingham and the Black Country, for example, seem much smaller when compared with Hams Hall. On Fig. 1 the ratio between Nechells (Birmingham) and Hams Hall was 137.5 mW., to 570 mW. On Fig. 2 the ratio becomes 85 million units to 1,812 million units. Similar comparisons can be made between stations in London (Figs. 3 and 4) and in the larger provincial cities (e.g. Liverpool, Bristol and Leeds). Many of the inland stations away from the coalfields are also reduced in significance.

Those stations with proportionately lower outputs operate at the daily peak-load periods only and generally close down overnight, and those with proportionately higher outputs are base-load stations which operate all or most of the time. The peak-load stations are generally the older, less efficient and less carefully sited stations and the net effect of this map is to reduce their significance while the general pattern remains the same as on Fig. 1.

⁸ British Iron and Steel Federation. *Statistical Year Book* (1948), Part 1, Table 32.

⁹ Some stations appear on Fig. 1 and not on Fig. 2. These stations produced fewer than one million units in 1946-47 either because they were very small and inefficient stations, or because they had not come into operation at that time: cf. respectively, Taunton and Meaford (South of the Potteries).

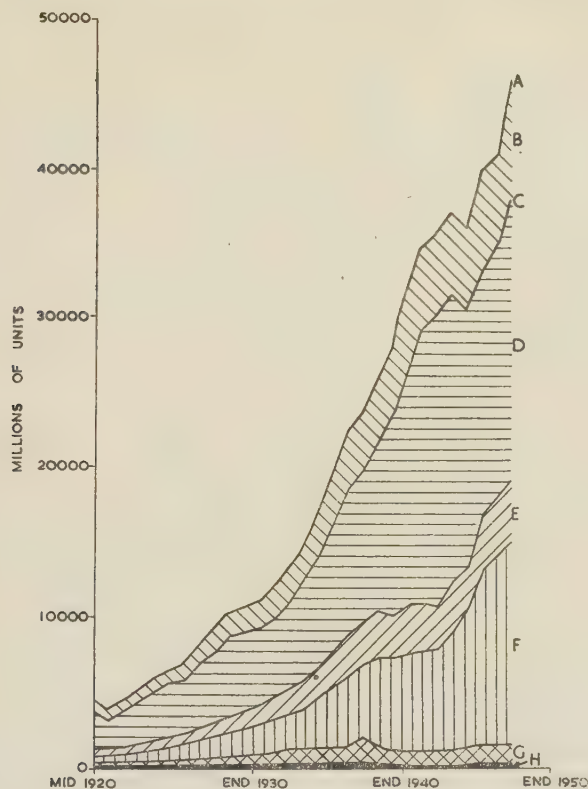


Fig. 5.—The Development of Public Electricity Supply in Great Britain, excluding the North of Scotland District.

- A. Units generated.
- B. Units used at generating stations and lost in transmission and distribution (less purchases from sources outside).
- C. Total sales to consumers.
- D. Sales for industrial purposes.
- E. Sales for shops, offices, public buildings, etc.
- F. Sales for domestic and farm purposes.
- G. Sales for traction purposes.
- H. Sales for public lighting purposes.

Source : First Report of the British Electricity Authority, Appendix 2.

The demand for electricity is expanding rapidly. The amount generated for public electricity supply in Great Britain south of the Scottish Highlands has increased from about 4,000 million units per annum in 1920 to about 45,000 million units in 1948 and 49,000 million units in 1949 (Fig. 5). The supply is expanding rapidly but power cuts and voltage reduction testify that this expansion has not yet overtaken the peak-period demand especially in the winter months. The First Report of the British Electricity Authority states "At 31st March, 1949, the total installed capacity of generating plant under the control of the Authority and connected to the grid was some 12,900,000 kilowatts, and upwards of 30,000,000 kilowatts of new plant will probably be

required to meet the increase in demand and provide for replacements during the next twenty years."¹⁰ The effect of the war has been to retard the construction of new plant and now the Authority is striving to reduce and eliminate the shortage.

Fig. 6 shows the distribution of new power stations and extensions under construction or planned by the British Electricity Authority.¹¹ The pattern largely reproduces that of Fig. 1 but with distinct and important differences in detail, notably in the proportional increase in capacity over and above that already installed in the major populous areas. Central Scotland shows an approximate increase of only 45 per cent.; North-east England 83 per cent. (including Blaydon 180 mW); South Lancashire 72·5 per cent.; the West Riding 63 per cent.; Birmingham and the Black Country 46 per cent.; South Wales 184 per cent.; and London 96 per cent.

Not included in these increases are a number of new stations and extensions which are under construction elsewhere. In the south new stations at Cliffe Quay (Ipswich), Poole and East Yelland (near Barnstaple) are intended to serve areas formerly without adequate generating facilities. All three have tide-water sites. In the Scottish Highlands many new hydro-electric plants are being built or are planned, up to a total capacity of over 600 megawatts, a capacity somewhat less than that projected for Uskmouth. The North of Scotland Hydro-Electric Board will of course sell surplus current to the British Electricity Authority, thus largely accounting for the relatively small increase in the capacity of stations in Central Scotland.

It is in the Midlands, however, that the most interesting changes are taking place. Apart from the new stations on old sites at Walsall (180 mW) and Nechells (210 mW),¹² and a small extension to the station at Leicester, most of the new capacity is to be found on the banks of the Trent. Stourport "B" (120 mW) is the only newcomer to the Severn; but the Trent, with Meaford (180 mW)¹³ in its upper reaches, will have at least three large new stations and one large extension between Burton and the Humber. These four stations, Drakelow (480 mW, ultimately), Nottingham (about 300 mW), Staythorpe (360 mW) and Keadby (at least 180 mW) are the beginning of what may well prove to be the balance-staff of electricity production in England. Staythorpe may ultimately be doubled in size; two further stations are in the design stage for sites between Drakelow and Nottingham and there is the possibility that additional stations may be built between

¹⁰ *First Report of the British Electricity Authority* 1949, 25.

¹¹ *Ibid.* Appendices 20 and 21; *Garcke's Manual* 1948-49. Since Fig. 6 was drawn particulars of four additional new projects have been published: new stations at Blaydon-on-Tyne (180 mW); Connah's Quay (Chester, 60 mW); Ince (Capenhurst, 60 mW), and an extension at Hayle (Cornwall, 20 mW).

¹² The present stations at Walsall and Nechells are old and will be closed as soon as circumstances permit; thus the net increase in Birmingham and the Black Country is less than 46%.

¹³ Meaford is shown on Fig. 6 as having a capacity of 60 mW. The remaining 120 mW came into operation in 1948 and is shown on Fig. 1.

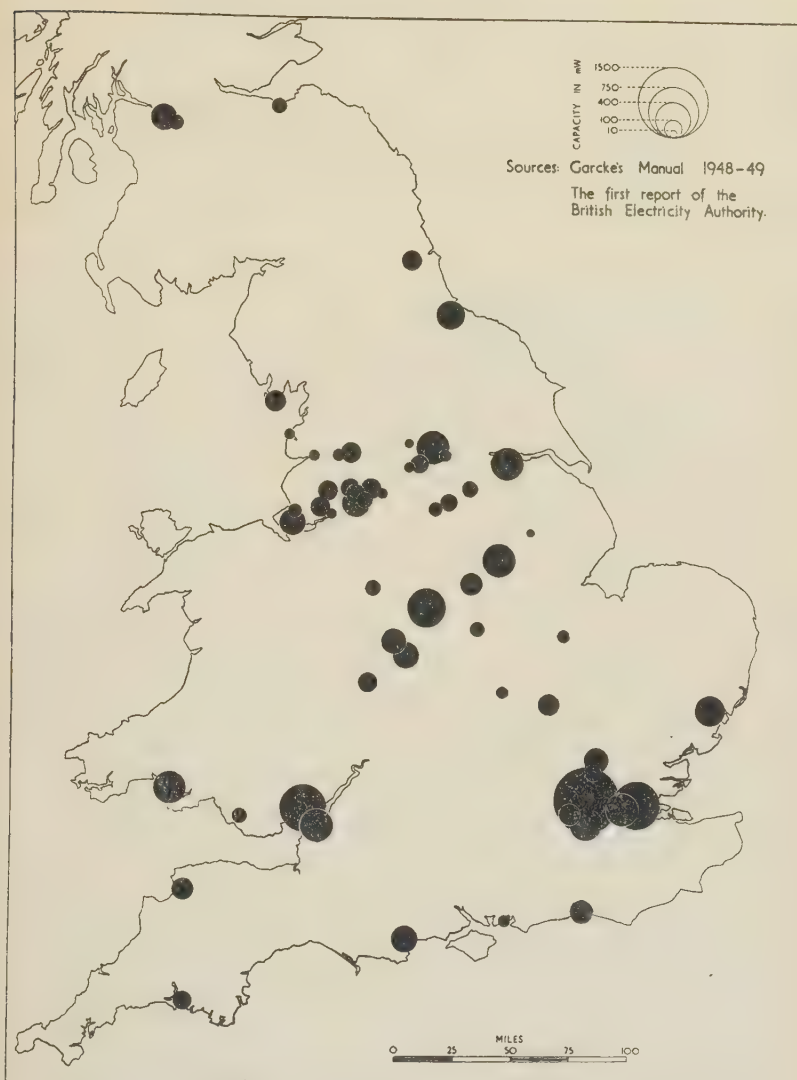


Fig. 6.—Coal-driven Electricity Generating Stations.
Capacity of post-1948 development.

N.B.—The large symbol for London represents the total post-1948 development in the London Division of the British Electricity Authority.

Staythorpe and Keadby. Although Birmingham and the Black Country show a relatively small increase, new generating plant in the Midlands as a whole will amply compensate for this apparent local deficiency.

THE LOCATION OF POWER STATIONS

There are four major factors involved in the location and siting of power stations. They are :—

1. That the location be as near as possible to the load centre of the area which the station is to provide with current ;
2. that the location be readily accessible for the cheapest possible supply of coal¹⁴ ;
3. that the site should possess an adequate supply of cooling water ;
4. that the site, besides being as cheap as possible should contain enough space for the needs of the station.

1. In the early period of the electricity supply industry, before high-voltage transmission was technically possible, the areas supplied were small and lacked interconnections. Most localities with a demand sufficiently concentrated to make electricity supply profitable had their own generating plant, and the distribution and location of generating stations were directly linked with the distribution of population.

Subsequent developments in high-voltage transmission permitted the Central Electricity Board to establish the " Grid " and to concentrate electricity production in a limited number of large generating stations¹⁵ chosen for their efficiency and low operating costs. It also made possible a reduction in the reserve plant which each formerly isolated generating station had had to possess. With this surplus capacity available the amount of new plant required in the early period of the " Grid " system was much less than would otherwise have been the case. Furthermore most of the new plant constructed under the direction of the Central Electricity Board was added to stations already in existence at the time when the " Grid " came into operation. Thus apart from certain exceptions, notably in the west Midlands, the location of stations was determined within narrow limits by the location of the concentrations of the demand for power as they existed before the " Grid " was built. Other factors were subordinate. In fact " the fundamental principle on which the 1926 (electricity) Act was based and the Grid established was the creation of a system of interconnecting transmission lines between generating stations placed as near as practicable to the load centres and extended or increased in number as and when required. The Grid thus differs essentially from most high-voltage transmission systems abroad in that it is not intended or designed for the bulk transmission of large supplies of electricity from generating stations remote from the load centres."¹⁶ The bulk transfer of power did, however, take place during the war¹⁷ and has by now become normal practice within the limited capacity of the " Grid."¹⁸

¹⁴ *First Report of the British Electricity Authority*, 1949, 32 and 33.

¹⁵ Usually termed " Selected Stations."

¹⁶ Central Electricity Board. *Annual Report* 1938, 3.

¹⁷ Central Electricity Board. *Annual Report* 1944, 2.

¹⁸ *First Report of the British Electricity Authority* 1949, cf. end columns of appendices 5 and 22.

The increasing demand for power necessitates the construction of many new stations and since, "some areas are better endowed with potential sites than others an increased use of electrical transmission may therefore be necessary."¹⁹ To-day it is less a question of the location of the demand for current than of the location of the coal and the comparative cost of transporting coal and transmitting electricity. The ability to transmit electricity efficiently over distances formerly considered impossible, and the marked upward trend in the cost of coal transport combine to emphasise the importance of the general national demand as distinct from local demands in the siting of new stations. One of the reasons, for example, for the choice of Staythorpe as the site for a power station was that it is near the load centre for the whole country, not merely that it was a suitable site within the area served by the former Derbyshire and Nottinghamshire Power Company. It is likely to function as a key station for balancing the national electricity load and the importance of its central position is emphasised by its selection as one of the termini of the first link in the new 275 kV transmission line which will eventually form the backbone of the entire transmission system.

2. Accessibility to adequate supplies of coal is an important factor in the location of power stations,²⁰ but there is no basis at present for the strict application of the argument that each power station should be adjacent to a colliery. A 360 megawatt plant (a common size among the new stations) uses over 23,000 tons of coal weekly and there are few collieries which produce that amount. Furthermore most power stations use only poor quality coal of low calorific value,²¹ while the better coal is sold at a higher price to other consumers. Thus a power station must draw widely for its supplies and should ideally be located near a communication node suitable for the assembly of large quantities of the small, often untreated coals from a number of collieries.

3. The third condition is a siting factor. Power stations need enormous amounts of cooling water to condense the steam which has passed through the turbines. This steam is turned back into water and returned to the boilers for reheating. Under present conditions over two million gallons of cooling water are required hourly²² for every 60 megawatts of installed capacity in operation. The City of Nottingham Water Board supplies an area with a population of about 500,000 persons whose normal requirements total 20 million gallons *daily*.²³ Nottingham power station, when it reaches its ultimate capacity of about 300 megawatts will have a peak abstraction rate of some 12

¹⁹ *Ibid.*, 32.

²⁰ Coal purchases, even excluding transport charges, comprise over 60 per cent. of the works costs of generation. (*Ibid.*, 50 and appendix 25).

²¹ *Ibid.*, 51 "of coal supplied to the Authority, more than 60 per cent. was untreated. The remaining 40 per cent. of better quality coal was burnt almost entirely at generating stations remote from the coal-fields."

²² Approximately 89 cu. secs.

²³ Information by courtesy of the Chief Engineer, Nottingham Corporation Water Board. These figures include consumption for all purposes but exclude any from private sources of supply.

million gallons *per hour* from the Trent, and a daily "consumption" far in excess of the city and district. Of course nearly all the water abstracted is returned to the river, but at a higher temperature. It is fortunate that the normal low water flow of 22.5 million gallons per hour²⁴ occurs in summer when the station is unlikely to be working at full capacity.

Where the supply of water is insufficient for this method of direct cooling then cooling towers must be erected. Hams Hall "B"²⁵ has four cooling towers each with a capacity of five million gallons per hour. The loss of water by evaporation from each tower, when operating at about three quarters capacity, is of the order of 45,000 gallons per hour, but there is in addition the water used for cleaning the ponds beneath the towers and sluicing out the ash from the furnaces, and thus even at this cooling tower station ten million gallons are pumped daily from the River Tame.²⁶ That figure is half the public supply of the Nottingham district.

The demand for water limits very severely the number of sites available for large power stations even when using cooling towers, and where water is scarce a very strict limit is imposed on the size to which a station may be developed.

Out of a total of 7,241²⁷ megawatts of new plant scheduled for the period 31st March, 1949, to the end of 1952, 64 per cent. will not use cooling towers. 72 per cent. of the capacity of the 22 stations on entirely new sites will use direct cooling methods and it is clear that such sites are chosen in preference to others where cooling towers would be needed.²⁸

4. Among other conditions involved in the siting of power stations is the desirability of cheap land of a low rateable value, a feature common to most industries needing large amounts of space. It is perhaps more significant for power stations since their demands for labour in proportion to the value of raw materials and output are much lower than other large-scale heavy industries. Hams Hall "B," for example, has an installed capacity of 321 megawatts, consumes over 3,000 tons of coal daily and operates on a three-shift system, but it has fewer than four hundred employees. Thus the incentive to site stations near to a plentiful supply of labour in localities where rateable values and the price of land are likely to be high is much less in comparison with most other industries.

Apart from station buildings space is required for cooling towers, if any, for sidings, coal handling plant, coal storage dumps and, some-

²⁴1,000 cu. secs. (Private communication from the Chief Engineer, River Trent Catchment Board).

²⁵The site at Hams Hall comprises two stations Hams Hall "A" (249 megawatts) and Hams Hall "B" (321 megawatts).

²⁶*Hams Hall "B" Power Station* a brochure issued by the Midlands Division, British Electricity Authority.

²⁷*First Report of the British Electricity Authority* (1949), appendix 21.

²⁸If direct cooling is possible then it has two major advantages. The station is cheaper to construct and theoretically the thermal efficiency in relation to units sent out can be greater.

times, for ash disposal. One large station approaching 600 megawatts in capacity has a site some 1,000 acres in extent including about 28 miles of railway track with siding accommodation for 1,000 full and 500 empty wagons. Over 6,000 tons of coal are delivered daily and space is allowed for a reserve stock of about nine weeks' supply.

Probably the greatest need for space is for ash disposal. This forms no problem where the station uses the stoker-fired or chain-grate furnace, which produces its waste in the form of clinker. This is in demand for road construction and in the building trade and is sold, exchanged or occasionally given away, but its disposal offers no difficulty. But the use of pulverised coal, a slightly more efficient method of heating, presents a considerable problem. The ash content of the coal used varies from 10 per cent. to as much as 30 per cent. implying a considerable ash output when the daily consumption of a 360 megawatt station is 3,500 tons of coal. For an average ash content of about 15 per cent. this station has to dispose of some 500 tons of waste daily, and no more advantageous way has yet been devised than dumping. The methods of removal result in the waste heap taking the shape of a level raised area which could in favourable circumstances be covered with soil, grassed and used for playing fields and perhaps even for agriculture. When, however, there is insufficient space for dumping at the site to last the life of the station, the settled ash must be removed elsewhere to make way for more.

PRESENT TRENDS

The long-run tendency is clearly for the number of stations to decrease and for generation to be concentrated in larger units, but the larger the station the more exacting are its locational requirements, both general and local, if it is to be efficiently operated. This explains the siting of the large new station some distance away from the nearest local load centres and concentrations of population, which besides being physically incapable in many cases of fulfilling the requirements of the station, may not be sufficiently large to take all the power produced.

A second trend, linked in part with the first, is towards significant alteration of the earlier regional ratio of national production. South Wales, for example, shows an increase (184 per cent.) which must surely be out of proportion to its needs,²⁹ even taking account of the broadening of the basis of industry there, and much of the current produced will undoubtedly be transmitted to other parts instead of coal which would otherwise have to be transported. The two stations Uskmouth and Carmarthen Bay, which include most of this increase, have direct cooling facilities and easy assemblage of small coals from a number of collieries by a short haul downgrade, but their expansion clearly represents not only locational advantages, but also the greater ease of trunk transmission of current than of transport of raw coal. The London area where only four of the seventeen new stations and

²⁹ The South Wales Region had a small surplus in 1949.

extensions are away from the Thames shows a 95 per cent. increase which must relate largely to the relative cheapness of the coastal transport of coal when compared with transmission costs from Northumberland and Durham.

The most striking instance of this trend to differential regional development, however, is the current and projected expansion along the River Trent from Drakelow downstream. Here there are several peculiar advantages.

1. The river is centrally placed to supply power to industrial England.
2. It flanks the largest and most productive coalfield in Britain, besides flowing near others in the Midlands.
3. It provides a sufficient flow of water for most of the year to carry one 400 megawatt station every ten miles below Burton.
4. It is flanked and crossed by a number of railway lines many of which work far below capacity.
5. It is the only large river in England able to satisfy all these conditions.

Present trends in the location of power stations relate to the interaction of a number of factors rather than the overriding importance of a single factor (the local demand for power) as was formerly the case. But the spate of new building, the closing down of old, inefficient and badly sited stations and the increase in the capacity of the "Grid" have not yet progressed far enough materially to alter the distribution pattern, which is still for the most part related to the distribution of population. Coal and water supplies and requirements of space are the significant factors in the location of new stations, and a distribution pattern more in keeping with this different emphasis should gradually emerge as the expansion programme continues. Many of the broad features of the present pattern will undoubtedly remain, however, since the concentrated markets for electricity and the densely peopled areas of Great Britain are in large measure to be found on or near the coalfields.

I am indebted to the Divisional Controller, Mr. W. S. Burge, and to Mr. F. Poynton of the East Midlands Division of the British Electricity Authority for the help they have generously given me in providing data for this paper.

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WALTER MAAS*

THE surface forms of Poland, and the superficial deposits of which most of them are built, are the creations of the Ice Age. If we except the Carpathian mountains and their immediate neighbourhood, we can distinguish in Poland four different types of landscape :

1. The immense valleys cut by the glacial meltwaters which cross the country from east to west. These *Urstromtäler*, as the Germans call them, contain the east-west reaches of several of present rivers, the Vistula, Warta and Oder in the east, the Spree, Havel and Elbe further west ; immediately after the Ice Age the upper Vistula thus passed through the Oder into the Elbe and so into the North Sea. These *pradoliny* (to use the Polish name), had tributaries from the south which now form the reaches of the present rivers that run from south to north.
2. Somewhat to the north of each are the ridges of terminal moraines, running more or less from east to west.
3. These ridges run across the plain of the ground moraine, covered with loam or boulder clay.
4. On many parts of this plain we find sandy surfaces created by the waters of the thawing glaciers which washed out all silty particles. These *sandr*, as geologists call them (from their Icelandic name), contain only sands and are thus very infertile. They are to-day mostly covered by pine-woods or even by heath.

The history of the colonisation of these various types of landscape has been different. The plain of the ground moraine was occupied in pre-historic times, as were also the ridges of the terminal moraines in their drier parts ; but the wetter and sandier parts were colonised in the middle ages by colonists living under the German right, the *jus theutonicum*. So at about 1500 A.D. there remained only the marshy *pradolines* and the *sandr* to be settled.

There are countries in the world where nature itself educates the inhabitants to a special form of life, e.g. the Netherlands : *Deus mare, Batavus terram fecit*. A great part of the Netherlands has been conquered from the sea by turning swamps and marshes into meadows and fields. The Dutch did this work not only in their own country but also on the Atlantic coast of France, in the English Fens, on many parts of the German coast, and in Poland. They came in 1530 to the mouth of the Vistula. This emigration took place for economic, social and religious reasons. Many of the newcomers were Mennonites. There were very old commercial relations between Holland and the city of Danzig. Several Dutchmen had taken up residence at Danzig, and they were instrumental in bringing the first Dutch peasants to this region.

* Dr. Maas was formerly Dozent at the Kanthuchschule at Brunswick and is now Professor of Geography at the University of Dacca, Pakistan.

These Dutchmen reclaimed much land in the swampy delta of the Vistula. The other peasants on the higher but sandier grounds saw with astonishment the cattle being raised and wheat being grown on lands which had hitherto lain waste. But not only the peasant neighbours saw this with amazement : so also did the Polish gentry who came to Danzig to sell their wheat and their potash. They thought that the Dutch colonists could do similar work on their estates further up the Vistula and even right in the interior of Poland.

So in 1564 we see Dutch settlers in the region of Graudenz, in 1600 near Thorn, and in 1616 25 miles beyond that town. In 1629 Dutchmen are negotiating with the city of Warsaw about the colonisation of the islands in the Vistula near that city. By about 1650 they are on the mouth of the river Wieprz. But this great wave of migration had its forerunners. The great Chancellor of Poland, Jan Zamoyski, having been governor of the Marienburg, the former castle of the Teutonic Knights, near Danzig, and having seen the activity of the Dutch colonists there, conducted some of them in 1599 as far south as Zamość near the river San, a tributary of the Vistula in Galicia. Another nobleman brought Dutch settlers in 1617 to the south of Brest Litovsk on the river Bug. In 1605 the daughter of the starosta of Graudenz married the lord of the manor of Filehne on the river Netze, a few miles from the boundaries of Brandenburg. As a dowry she brought with her some Dutch settlers. Their sons emigrated into Brandenburg and colonised the swamps of the Netze near Driesen and those of the Warta near Landsberg. Here we find to-day villages whose names : Morensche Holländer, Landsberger Holländer, etc., clearly indicate their origin. The sons of these settlers migrated up the Warta to Poznań and, a little later, even much farther to Częstochowa, the well-known place of pilgrimage.

That generation had already forgotten Holland. These colonists did not speak Dutch, they spoke the German dialect of Brandenburg. But they are still called, in the documents of the 18th century, Dutch settlers. For in the meantime the word " Dutch " (*Hollender* in Polish), had lost its original meaning, a man from the Netherlands. It had a new meaning : a man under Dutch right, *more Hollandicorum*, doing a special job, an especially difficult one, and having therefore special rights. The first of these was that he was free, he was not a bondman, not *adscriptus glebae* as were nearly all the Polish peasants of this time. He could leave his lord ; and, in fact, the Dutch settlers very often did so, which explains their migrations and their rapid penetration of western Poland.

Let us return to the Vistula near Thorn. There was a village called Przylubie. The lord of the manor in 1595 had the intention of settling Dutch colonists on the waste lands but not knowing any, he gave an order to a citizen of Bydgoszcz (Bromberg), who fulfilled the wish of the Polish nobleman. He was William Robin, a Scotsman who had settled several years previously in that town. Between Bydgoszcz and Inowrocław there is a little brook, called Zielona Struga, Grünfliess. This

region was colonised "in the Dutch manner" by Pomeranians in 1660. We are here in the part of Poland called Cujavia, a part of which is very fertile and has been inhabited since neolithic times. Parts are swampy and much was covered by pine woods, mostly on the sandr. In the 18th century thousands of Pomeranians came here, driven from their country by the ever-growing amount of work demanded by their lords. These men not only drained swamps, they also felled the pine woods. The work of the deforestation of Poland thus continued, of Poland whose whole history is the story of the escape of a people from its forest-prison. These Pomeranians are always called *Hollendry* in the documents of the time, like the real Dutchmen and their descendants.

There was a third focus of emigration of so-called *Hollendry*, namely Silesia. In the 18th century many people, for the same reasons as the Pomeranians, left Silesia and came to Poland, especially to the south of the provinces of Poznań and Kalisz. In the region whose centre is now Lodz—then a little village—the two streams of migrations of the "Dutch," the Pomeranians and the Silesians, met about 1790. As those two German groups used different forms of villages, you can distinguish the two streams simply by looking at the map. If you draw a map of the "Dutch" villages in Poland¹ two salient points become clear. First, you can discern on this map the lobes of the ancient glaciers, as you would on a geological map, because the "Dutch" villages follow the arcs of the terminal moraines very closely. So a fact of the geological history of the country nearly 10,000 years ago is reflected in a fact in the present human geography.

But this map of the "Dutch" villages shows another relationship. Not all the *sandr* contain "Dutch" villages. If we search for the reason for this, we find that where they are missing there were no starosties, i.e. royal estates given for a few years to a man of merit, called a starosta. A starosta had every incentive to gain something quickly from the estate which he administered only for a couple of years.

We must now give a short account of the history of agriculture in Poland since the middle ages. From 1200 to 1500 a great wave of colonisation took place, and the lord of the manor who formerly worked himself with the bondsmen or slaves, changed into a proprietor of land let to the peasants who had to pay rents fixed in silver money. It is a well-known fact that the value of silver diminished constantly; in other words, prices rose. With the same amount of rent on which the lord could live well in, say, 1350, he was starving in 1450. The way out for him was to force the peasants (*a*) to give some land back to the lord for direct cultivation and (*b*) to work for the lord. This work for the lord (*corvée* in France, where it also played a great role, *Fron* in Germany) grew constantly. For a *mansus*, *lan*, *Hufe*, a unit of peasant possession of about 37 acres, the peasant had to give so many days work for the lord per week: in 1481 a day, in 1520 two days, in 1581 six days,

¹ I published such a map in the *Deutsche Monatshefte in Polen*, Katowice, October, 1939.

in 1603 24 days, in 1618 32 days, in the 18th century 49 days.² When the requirement is more than seven days per week, that means that the peasant was obliged to send a second, third, etc. "hand" (whom he had to keep) to the manorial work. It is true that generally the *mansus* was divided up, and in 1500 there were very few peasant holdings amounting to a whole *mansus*, whilst even those of half a *mansus* were rare; but there were holdings of $\frac{1}{8}$, $\frac{1}{16}$, even $\frac{1}{32}$ of a *mansus* (i.e. about one acre) in the hands of a peasant family (an analogy with the conditions of to-day).

There was a second reason for this development. Since 1466 Western Prussia (i.e. the region corresponding roughly to the "Polish Corridor" of modern times) with the lower Vistula had belonged to Poland, and when the demand for wheat in England, France, Flanders, etc. grew, because of the beginnings of industrialisation in those countries, the export of wheat from Poland via Danzig to the west of Europe developed. Danzig became a rich city from this commerce in wheat and that in potash, also sent down the Vistula. But this satisfactory development was interrupted by the Polish-Swedish wars of the 17th and 18th centuries. No Dutch nor English ship came to Danzig and it was about this time that Russia entered the world wheat market. The prices at Danzig fell: thus, according to Professor Bujak and his pupils, the price of a bushel of wheat in grammes of silver was as follows:

1651-1660	..	28.0
1681-1690	..	10.7
1691-1700	..	17.7
1701-1710	..	10.4
1711-1720	..	13.5
1721-1730	..	11.1
1731-1740	..	12.3

So the Polish gentry, menaced by ruin, looked for a way out. Until the 17th century they made their cash-tenants into farmhands working directly for the lord; and they should now have re-established these farmhands as peasants at current economic rents. This, however, was not possible. The farmhands had lost all initiative and could not work independently. In order to receive rents the lord had to have new settlers, mostly foreigners, i.e. "Dutch" peasants. This was especially urgent for the starostas. Additionally, the gentry tried to develop more cattle-breeding in which the "Dutch" were also helpful. Thirdly, to find other revenues, the gentry turned more to forests than before, for the production of potash, and here again the "Dutch" (especially the Silesians) were very useful.

It is true that Poles also were employed in this industry. There are many Poles to-day bearing the name of *Nowak* (you could translate that by *Newman*); in the 18th century this name was the appellation of men who worked on grounds recently reclaimed from the forests, which were called *nowiny* (in Latin *novalia*). This word became also the name of many villages.

² According to Lubomirski *Biblioteka Warszawska*, 1857, Vol. II, p. 834.

To resume, the map of the "Dutch" villages reveals the lobes of the glaciers, but it also reveals the starosties: this old form of organisation of the Polish state is inscribed upon the soil of that country. There were 2,000 "Dutch" villages in Poland. Not all of them exist to-day, for many had been founded on very bad soils, barren sands where they could not live. Others survived in spite of all. This new chapter of the history of the occupation of the Polish soil was made possible, like that of the colonisation in the middle ages, by the introduction of new methods of agriculture. In the middle ages it was a new instrument: the true plough, which made it possible to occupy the wetter and sandier lands. Now the "Dutch" used new methods: on the ooze and peat of the pradolin they had to use sand: 1,200 cart-loads per acre. Hence only free men, knowing that they (and not the landlord) would profit by the results of their efforts, could be entrusted with the immense work of draining the swamps and marshes. In the sands of the sandr it was necessary to fertilise the soil. Artificial fertilisers were still unknown and they used natural ones: dung (the "Dutch" kept more cattle per acre than their Polish neighbours), straw, silt, lime, peat, and composts of such materials, even shells and snails, etc. But all this would not have saved them if a new plant had not been introduced about 1780-90, namely, the potato. Potatoes, living on very poor soils, made it possible to occupy the sands of the sandr. This process could be described as "Potatoes versus Pines."

Many a house originally built in a wood by a "Dutch" settler is now inhabited by a forester. Here the "Dutch" peasant evidently could not live by agriculture; but from about 1800 onwards the modern methods of forestry required more forest officers. They occupied such abandoned settlements of the Hollendry. This happened especially in Prussian Poland. In Russian Poland, where the state did much less for forestry, the hamlets of the "Dutch" settlers simply ceased to exist: many of them shown on the map by Gilly (*Spezialkarte von Südpreußen* published at Berlin in 1803) are not mentioned on the map drawn by the officers of the Polish army between 1825 and 1830 and published in 1839 by the Russian general, Rychter,³ for more than 50 years the best map of Central Poland. In other cases, the "Dutch" hamlets still exist, but they are not inhabited by the descendants of the founders, as emigration took place. In Prussian Poland many emigrated to western Germany, to the industrial regions of the Rhine and the Ruhr. In Russian Poland they emigrated further to the east. Thus, about 1880, the peasants of more than 20 "Dutch" villages of the region of Gostynin left for Wolhynia. Others went to Siberia.

We have discussed the geographical, historical and economic problems related to the "Dutch" villages. We may now briefly note some psychological questions arising from the proximity of the "Dutch" villagers to the Polish peasantry on the better soils. When, for example, in Cujavia, the "Dutch" settlers (in that case Pomeranians) first came

³ *Carte topographique du Royaume de Pologne*, scale 1:126,000.

and built their farmsteads in the swamps, the better places being already occupied, what jokes were made about the "frogs," "waterfowls," and so on! And when, after some time, the farms of these men prospered by their methods, appropriate to this environment, and by their zeal, the envy of the neighbours awoke. Soon they found an outlet for their bad humour. These "Dutch" settlers had to be very thrifty and had to work hard, so stories were circulated that they were so stingy that even the flies in their houses starved, that these people had always "just had lunch" (i.e. did not share their meals, and invited nobody), and so on. Or the neighbours would simply declare that the "Dutch," who are Protestants while the Poles are Catholics, were helped by the Devil himself to whom they had sold their souls. And speaking about proverbs there was one current among the settlers themselves, summing up their experiences: the first generation works itself to death, the second still suffers want, only the third gets its bread. Or in the original German:

*Der erste arbeitet sich zu Tod,
Der zweite leidet auch noch Not,
Der dritte erst findet sein Brot.*

A proverb which can be applied also to colonisation the world over.

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OBITUARY

PROFESSOR JOHANN SÖLCH (1883-1951)

It is a melancholy fact that our appreciation of this important book* must also be an obituary notice of its author, the continental geographer best known to his British colleagues. Professor Sölch, then at the university of Innsbruck and already becoming known as a student of surfaces of erosion in the Alps, began soon after the 1914-18 war his long series of study visits to Great Britain and Ireland; and the book specially under review is the first of two volumes giving in remarkable detail the results of his patient investigations, which characteristically depended primarily on personal observation during journeys to every district, but also omitted few, if any, sources of printed information.

Sölch was primarily interested in structural and physical geography. His friends and pupils published in 1951 a volume commemorating his sixty-fifth birthday on October 16th, 1948, and for the most part its contents dealt with the evolution of landscape and with climatic and other factors, but, characteristically, it also most appropriately included studies of cities, notably Dresden and Venice. Sölch's own studies were of the Austrian Alps especially since he moved from the chair at Heidelberg to that at Vienna about 1934. Tireless in the field until, recently, heart trouble limited his climbs, his keen eye seized significant points in the landscape and interpreted them with both care and courage. Glacial and peri-glacial morphology were naturally special spheres of interest for him.

But we must be concerned especially with Vol. 1 of this work on the British Isles, hoping that Vol. 2 is sufficiently advanced in preparation to be brought out in spite of his early death; he was not quite 68 when he died on September 10th from heart failure.

No book on Britain has given such a detailed account of each region of our country, and yet there is no dullness of repetition. If it is poles apart from the almost poetic *Tableau de la Géographie de la France*, it is also very different from the gazetteer type of book. Sölch tries to discuss the physical and the economic aspects of each small region and it is nearly always obvious that he has seen the place and walked along its byways. Probably few of us have done as much foot-sole geography in so many parts of Britain as did Sölch. Separate chapters deal with the South-east, London, the London Basin, Wessex, the South-west, East Anglia with the Fens and Lincolnshire, the Midlands, the North-east, the North, Lancastria and the Welsh Marches, the North-west, and Wales. The sections vary in length from about 30 pages to about 110 pages in the cases of Wales and the Midlands. Each section has a bibliography; that on Wales, for example, occupies 14 pages. County

* *Die Landschaften der Britischen Inseln. Erster Band: England and Wales.* Johann Sölch. 25 x 17 cms. x + 850 pp. Wien. Springer-Verlag. 1951. £8 12s. (Price for the two volumes £16 if ordered before, £19 14s. if ordered after, the publication of the second volume).

statistics of agriculture occupy a long appendix and have been very carefully tabulated. It is characteristic that Sölch has not sought to give a general picture; it has been the personalities of our little neighbourhood units that have captured his affectionate interest, and he sees very clearly that those personalities are the results of interaction between man and environment through centuries of life and work. Historical geography, palæoclimatology and vegetational sequences all get careful attention, with the result that a balance is attained in an unusual degree.

We are accustomed to think of Northern England as composed of north-east and north-west. It is interestingly fresh to find Professor Sölch differentiating a Middle North England to include the Cheviots and the Pennines and he gives special attention in this section to Sheffield as a type of city differing from Leeds and Manchester in its morphology and local relations. Wales gets 110 pages, and is treated as an entity. The thoroughness of Professor Sölch's effort is illustrated by his references in his discussion of Welsh place names, e.g. Presely and Plynlumon.

One might go on to many other interesting items in this remarkably detailed study of our country, but it is important to emphasise rather the attractive personality of a sincere scientific worker and a faithful friend. His cheerful conversation and ceaseless eagerness to penetrate to the heart of a problem, his anxiety to correct errors in his own work, and in that of others, his enthusiastically co-operative spirit and his readiness to consider the work and views of colleagues who started from a different viewpoint all combined to win the affection and the great respect of British geographers.

We cannot but be glad that the University of Glasgow at its 500th anniversary celebrations chose Professor Sölch to be one of the recipients of the degree of LL.D. *honoris causa*.

H. J. FLEURE.

CORRESPONDENCE

A MAP PROJECTION REDISCOVERED

In my article "An Equi-Rectangular Map Projection" in *Geography* (vol. 34, 1949, pp. 196-201), I expressed surprise that I was unable to trace a prior reference to so simple and effective a graticule. Herr Oswald Winkel, the distinguished German cartographer, however, now points out that in 1921 he published in *Petermanns Mitteilungen* (vol. 67, pp. 248-252, Plate 24) a set of projections which entitle him to priority of discovery of this equi-rectangular and that his rights are actually protected under the Berne Convention. I gladly acknowledge Herr Winkel's priority and wish to repeat that I did not in my article of 1949 make any claim to exclusive rights in these projections.

R. MILLER.

Edinburgh, July 1951.

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GEOGRAPHICAL ASSOCIATION

We welcome as our President in 1952 Professor Frank Debenham, O.B.E., the distinguished friend of teachers of geography in many parts of the world. The acceptance of this office by one of the senior university geographers of Great Britain will be a matter of great pleasure and pride to his colleagues and numerous former students.

THE NEW FINANCIAL YEAR

For the first time, the financial year began on September 1st. We thank those members who have responded by the prompt payment of the annual subscription; we would be very grateful if members who have not already done so would pay subscriptions, now overdue, at their earliest convenience.

THE COVENANTING OF ANNUAL SUBSCRIPTIONS

The executive committee has been exploring the possibility of submitting a claim for a refund to the Association, of income tax on all annual subscriptions paid under covenant by members. A form is issued with this number inviting members to covenant for the payment of the annual subscription for not less than seven years. Members who undertake to do this will render a considerable service to the Association without any additional expense to themselves, since they will make it possible for headquarters to submit a claim for income tax that has already been paid on this amount. The officers will be very grateful for the fullest possible co-operation by members in this matter, since, though the burden of rising costs (particularly of printing, paper, etc.) raises serious difficulties, they are anxious to defer consideration of the need to raise the annual subscription. A good response to this scheme might ease financial difficulties and so render such consideration unnecessary for some time to come.

Life members, who do not pay an annual subscription, will not of course be directly concerned with this project; but we shall be grateful for such help as they can give, particularly in the case of older Life members who compounded for Life membership under the former subscription rates, prior to 1948. A senior Life member has already sent an offer to covenant an annual donation equivalent to the yearly subscription for seven years. In expressing our thanks to him, we should like at the same time to commend this gesture to other Life members who may feel able to offer under covenant either a similar or a larger or smaller amount. Any Life member who wishes to do this may obtain a special form of agreement on making application to headquarters.

ANNUAL CONFERENCE, 1952

The Annual Conference will be held in the London School of Economics from January 1st to 4th, 1952. A copy of the programme is included with this issue. Four new members of Council will be elected at the Annual General Meeting, to replace retiring members. Nominations signed by four members should reach the Honorary Secretary not later than November 30th.

ANNUAL CONFERENCE TEAS

The attention of members is drawn to the announcement in the March issue of *Geography* concerning the opening of a fund to meet the cost of the provision of a tea at the Annual Conference, donated by the non-metropolitan members and branches. We are grateful for donations sent earlier this year. Contributions which individual members and branches, other than those associated with the Westminster and Central London Branch, may care to make should be sent to headquarters. All donations will be acknowledged.

SPRING CONFERENCE, 1952, AT TENBY: CHANGE OF DATES

It is now found that the dates previously notified (April 4th to 8th) fall within the school terms of a considerable number of Local Education Authorities, and the dates have therefore been changed to April 18th to 22nd. Accommodation will be provided in hotels, and for this early application is essential as reservations cannot be indefinitely delayed. Members are assured of a most attractive programme under the expert leadership and guidance of Professor Bowen. Booking forms will be included in the January issue of *Geography*. Enquiries should be addressed to Mr. W. S. Moss, Trinity College, Carmarthen, who is acting as the local Hon. Secretary for the Spring Conference.

SUMMER SCHOOL, 1952

The Honorary Secretary would be glad to receive the names of persons interested in the proposed Summer School to be held in South Wales at Coleg-y-Fro, Rhosse, from August 2nd to 16th, 1952, so that adequate preliminary bookings for accommodation may be made. We hope to circulate a full programme with the January number of *Geography*.

THE FIRST INTERNATIONAL CONFERENCE OF TEACHERS OF GEOGRAPHY

The conference held in Sheffield during August, 1951, was an outstanding success, and a full report upon it is included in this issue. The attention of members is especially drawn to the proposed International Union of Geographical Associations and Societies of Teachers of Geography. The acceptance of this proposal would ensure that, without additional costs to any members, or the need for the duplication of subscriptions, teachers of geography will be able to keep in touch with the work and points of view of colleagues in other countries, and to participate, from time to time, in foreign international conferences. The Geographical Association of Great Britain is glad to have had the privilege of playing a major part in developing this scheme and we hope that members will participate in the privileges and opportunities that should emerge in due time, if the proposed scheme comes into operation. Further details will be notified in due course.

Geographical Magazine

We have been informed by the Editor of the *Geographical Magazine* that as from October 1st the *Magazine* will cost 2s. 6d. a copy, and the standard subscription will be raised from 27s. to 33s. a year. It will be recalled that recently a special reduced subscription rate of 21s. a year, formerly available only to Fellows of the Royal Geographical Society, was extended to members of the Association. The *Geographical Magazine* will continue to be available to members of the Association at a reduced rate, the new rate being 25s. a year post free. Members who already subscribe to the *Geographical Magazine* at the old reduced rate will be reminded of the new rate as their subscriptions fall due for renewal.

O.S. MAP SETS

Since the announcement in the July issue of *Geography* concerning Map sets went to print, numerous orders have reduced the stocks of geological transparencies and picture sets to accompany the O.S. maps. It is regretted that these can no longer be supplied, and no date can as yet be given for new supplies. An announcement will be made in *Geography* when these items become available. Supplies are still available for purchase of the sets of six O.S. maps (Cairngorms, South Downs, Mid-Severn Valley, South Wales Valleys; water and contours only of the last two), price 4/6 per set, 4/3 if ordered in quantity.

BACK NUMBERS OF *Geography*

The Association wishes to thank members who have generously given back numbers of *Geography*, both part-sets and individual copies, for which an appeal was made in the May issue. Acknowledgments have been sent to members so far as possible; to those who sent copies anonymously the Association now takes the opportunity to express its thanks. Numbers still required are especially those parts of Volumes I to XIII listed in the May issue of *Geography*, and the indexes for the early volumes.

ACKNOWLEDGMENTS AND LIBRARY ACQUISITIONS

The Association is greatly indebted to the donors of books, reprints and maps which have now been added to the Library collection. Our gratitude for these gifts is acknowledged to Prof. S. H. Beaver, Prof. K. C. Edwards, Prof. H. J. Fleure, Mr. P. C. Garlick, Mr. N. R. Hiller, Mr. W. H. Hobbs, Mr. N. Pye, Mr. C. J. Robertson, Prof. L. D. Stamp, Miss D. Sylvester, Mr. T. C. Warrington; Michigan Academy of Science, Arts and Letters; National Research Institute of Geology, Academia Sinica; University of Aarhus, Denmark; University of Chicago; University of Utrecht; the Under Secretary of State for Air, Air Ministry; the Northeast Development Association, Newcastle-on-Tyne; the State Information Office, Union of South Africa; the Oxford University Press; and the Public Affairs Press.

The titles of a number of these acquisitions are given here as they will not normally appear in the review columns.

A. M. Met. Office. Aviation Meteorology of the Route Marseilles—Castel Benito. Met. Report No. 4. MO 496d. 1949.

— Aviation Meteorology of the Route Castel Benito—Cairo. Met. Report No. 5. MO 496e. 1950.

— Upper Winds over the World. Brooks, Durst, Carruthers, Dewar and Sawyer. Geophysical Memoirs No. 85. MO 499e. 1950.

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Trueman, A. E. This Strange World.

Union of South Africa. State Information Department.

— Foreign Policy in the Union of S. Africa. D. F. Malan. 1950.

— Native Policy in the Union of S. Africa. E. G. Jansen. 1950.

Vale, E. Ancient England. 1941.

Aarhus University. Danmarks Areal. Erik Lund. 1950.

University of Chicago. Department of Geography Research Papers.

- No. 1. Educational Land Use in the River Forest-Oak Park Community. H. H. Gross. 1948.
 - No. 2. Educational Land Use in Lake County, Ohio. E. E. Eisen. 1948.
 - No. 3. The Cultural Pattern of South Tyrol. G. G. Weigend. 1949.
 - No. 4. The Livelihood Structure of Des Moines, Iowa. H. J. Nelson. 1949.
 - No. 5. Expressions of Urbanism in the Sequent Occupance of North-eastern Ohio. J. S. Matthews. 1949.
 - No. 6. Japanese Pre-war Trade and Shipping in the Oriental Triangle. N. S. Ginsburg. 1949.
 - No. 7. The Struggle for Wolfram in the Iberian Peninsula. June 1942-June 1944. J. H. Kemler. 1949.
 - No. 8. The Geography of Education in the Winnetka and Bridgeport Communities of Metropolitan Chicago. A. K. Philbrick. 1949.
 - No. 9. Functional Patterns in the Guadalupe Counties of the Edwards Plateau. V. Bradley. 1949.
 - No. 10. A Union List of Geographical Serials. Harris and Fellmann. 1950.
 - No. 11. Manufactural Occupance in the West Central Area of Chicago. M. J. de Meirleir. 1950.
 - No. 12. Truck Transportation Patterns of Chicago. J. D. Fellmann. 1950.
 - No. 14. Recreational Occupance of the Moraine Lake Region of North-eastern Illinois and South-eastern Wisconsin. R. A. Harper. 1950.
 - No. 15. Land Use in Greenbrier County, West Virginia. J. H. Wheeler. 1950.
 - No. 16. The Settlement of the Saginaw Basin. M. E. McGaugh. 1950.
- University of Utrecht. Geographisch Instituut Publication No. 1. Geomorfologie (van Nederland). Jacoba B. L. Hol. 1948.
- Michigan Academy of Science, Arts and Letters. Papers, Part III, Geography and Geology. 1941 to 1948. Individual articles in these Papers will be included in "Geographical articles in Magazines received" in the January 1952 issue of *Geography*.

The Honorary Librarian would like to remind members that all journals mentioned in the lists of geographical articles may be borrowed from the library.

In making up arrears of binding of journals, it has been discovered that the Index to Volumes 58-59, 1942-43, of the *Scottish Geographical Magazine* is missing from the Association Library copy. Should any member possess either a spare copy of this Index or a copy which is no longer required, the Hon. Librarian would be most grateful to receive it in order to complete the set of the *Scottish Geographical Magazine*.

REVIEWS OF BOOKS

MEMBERS of the Library should know that, with very rare exceptions, books reviewed in this journal may be borrowed from the Association's library.

Seas and Shores of England. Edmund Vale. 13.8 × 22.3 cm. viii + 120 pp. London: B. T. Batsford, Ltd. 1950. 12/6

This pleasant little book, which has now reached its second edition, is by no means a geographical book. Such a gross over-simplification as "sand is found most abundantly near sandstone rocks," shows this; but such statements are rare. The book should be read by lovers of the coastal scene, read in a mood of enjoyment rather than with a desire for solid information. It will then be appreciated to the full, and appreciation will be heightened by the well chosen and clearly reproduced photographs.

W.V.L.

Companion into Cheshire. 2nd edition. J. H. Ingram. 13 × 19 cm. xii + 228 pp. London: Methuen. 1948. 13/6.

One of the county "companion books" in process of publication by Messrs. Methuen, this volume conforms to the common pattern for the series. It is an itinerary, dealing in turn with major sub-divisions of Cheshire: Wirral, Chester, the Dee and Gowy valleys, the central ridge, the Weaver valley, north Cheshire, the eastern borders of the plain, the north-eastern "pan handle" and the Pennine flanks. It contains 19 good photogravure illustrations and an oversimplified line and picture map of Cheshire as an end paper. The volume is a pleasant and well written example of this type of topographical work and an adequate index makes reference easy and in general profitable; it has a useful outline bibliography, in which, however, books of all types are mixed and in which unfortunately all are undated. The writing throughout bears the stamp of one who knows and revels in the pastoral beauty of this green shire and knows much of its history and lore. Apart from Chester, the larger towns receive scanty and superficial treatment but this is no doubt a matter of policy as the smaller and more picturesque market towns have fair attention. There is a scattering of errors, e.g. Audlem (p. 102) and Tarporley (p. 92) are both stated to be market towns, whereas they are former market villages; Barthomley is persistently spelt "Bartomley," and Ellesmere Port "Ellsmere" Port; the population of Crewe is stated to be 45,000 whereas it is now appreciably over 50,000 (p. 144); the implicit suggestion that a straight tower replaces the former crooked steeple of Wybunbury church is no longer correct (p. 103); and Chester has not been *successfully* a fortress, port, frontier, outpost, cathedral and market town (p. 38).

The title of Chapter V could more happily have been "The Central Cheshire Ridge" than "The Central Highlands" and the description of Cheshire scenic types by which the chapter opens is geographically unsatisfactory and inaccurate. Despite its occasional inaccuracies and the dearth of maps which is a fault of the series, for its purpose and its public, the book is good, useful and eminently readable.

D.S.

Our East Anglian Heritage. Lilian J. Redstone. 18 × 12½ cm. xiii + 161 pp. London: Methuen & Co., Ltd. 1951. 4/6.

This book describes itself as "something of an experiment in clothing the abstractions of general history with the flesh and blood of local examples." That it must have attained some measure of success in this aim may be seen from the fact that it is now in its third edition. It certainly succeeds in conveying a sense of the past, and the text takes every opportunity of making reference to local events and personalities. Chapter one at once raises the hopes of a geographer for it tells us that "this book concerns the East Anglian countryside and the people who, during many hundreds of years, have gradually changed it into the East Anglia where we now live." But whatever the merits of the book and they are many, the fact remains that as a study of the East Anglian countryside it is very unsatisfactory. It suffers from the drawback that it is not firmly based upon an appreciation of the local variety of East Anglian geography. The solitary map in the book (p. 152) is not only ill-produced, but inaccurate; the outline of the Breckland, for example, is a very curious one. The whole book would have gained much if it had paid attention to some of the well known accounts of the regional division of the area. One of the outstanding facts about the development of East Anglia is the way in which the agrarian changes of the 18th century altered the appearance of much of its surface. This is one of the great themes of English history in general, and, *a fortiori*, it is one of the great themes of East Anglian history. Yet the account of the work of "Turnip" Townshend and Thomas Coke (pp. 22 and 113) is disappointingly vague and general.

It may be said, in defence, that the geographer is, perhaps, looking for something that is outside the scope of the book. This is debatable, but the geographer expects to find, if not geography, at any rate sound history. When, on p. 44, he comes across a sentence like the one following, he may well wonder whether his eyes deceive him: "The very closeness of our East Anglian churches, in comparison with the very widely scattered parishes of the other counties, such as Devon, shows how enthusiastically East Anglians welcomed the new faith." This is misleading for the relative closeness shows nothing of the sort. What it does show is how different were the economic and geographical circumstances of East Anglia and Devon. If this book is an example of "the flesh and blood" of local history, then let us have the bones as well.

H.C.D.

Places of Natural Beauty. National Trust Guide. D. M. Matheson. 12.5 × 19 cm. vi + 170 pp. London: B. T. Batsford, Ltd. 1950. 8/6.

This is a very comprehensive reference book on its subject, yet it is almost of pocket size. It discusses every property, other than buildings, owned by the Trust in England, Wales, and Northern Ireland, describing the situation and interest of each, often recounting the circumstances of its acquisition, and recalling the donors. The descriptions are linked together to form a series of regional itineraries which indicate sufficiently how each property may be reached. It is very unlikely that one will use the book in practice as a guide for even one-tenth of the properties described, except for one's home district. The outstanding merit of the guide lies in its power to compel one to read on about places one is never likely to see; for the book is packed with odd bits of information—even gossip. One reads of the hunting of the red deer, of the birds of Farne, of the post-office worker who became a world-famous archaeologist. It will prove both a bedside book and a lure to the roads. It also forms a most interesting history of the accretion of the properties, fascinating in the casual nature of their growth in this age of planning.

The "maps" are disappointing—if such a name is merited by rectangles containing only names and correctly spaced-out location dots. Their value would be enormously increased if even streams were to be shown; they would give some idea of the lie of the land and help in locating places on larger-scale maps. The one map that shows some streams argues this case silently but forcibly. There are 23 well-chosen and well-reproduced photographs. F.J.C.

Switzerland. J. Russell. 14 × 22 cm. viii + 152 pp. London: B. T. Batsford, Ltd. 1950. 15/-.

The fine collection of illustrations, many of which are of fascinating Swiss towns, is accompanied by reading matter which hardly approaches the claim made for it that the book is to deal with the towns and their life. One finds that the author seems interested in the attitudes of Voltaire, Gibbon, Dickens, Rilke and others to life in general and, now and then, Swiss life rather than in the Swiss people themselves. That, at any rate is how the book strikes a reviewer with fond memories of long residence in Zurich and visits to many other towns and villages. The author apologises, not without need, for neglect of Appenzell. But Mr. Russell gives a good deal of attention to interesting features of architecture and often his casual remarks, as about the cathedral at Basel, have marked appropriateness. The beauty of Swiss towns and the sturdy democracy of its people need far more exposition than they have had in the 20th century. This book at any rate gives us many a choice view and sometimes an attractive and thoughtful comment. In Switzerland Calvinist Geneva, Romanist Fribourg, Zwinglian Zurich and, may one add, Erasmusian Basel are side by side in a republic with a wide tolerance of diversity and an intense loyalty to the *Eidgenossenschaft*, the society of the oath, an oath sworn more than 650 years ago by dwellers in rural Uri, Schwyz and Unterwalden to support one another against any aggression from without. H.J.F.

Spain. Sacheverell Sitwell. 14 × 22 cm. xii + 148 pp. London: B. T. Batsford, Ltd. 1950. 16/-.

This is Spain studied by an experienced traveller with years of thought on architecture and pictures, and, withal, an eye for popular festivals. In other books he has written much on Velazquez, El Greco, and, more critically, on Goya. Here he deals with architecture and the decorations of buildings, older and newer, often with incidental references to recent research on related topics. The high-sounding names like Santiago da Compostella tell of the pride that is historic in Spain and has contributed, along with the Pyrenees, to hold her apart from Europe, her courtly splendours hardly hiding the miserable poverty that has resulted from long repression of thought. But from the misery the author's eyes avert their gaze. He is concerned with beauty as he sees it, and some may not agree with his enthusiasm over the baroque west front of the cathedral at Santiago, and may feel more drawn to the solemn Romanesque of the nave and the Portico de la Gloria. Salamanca is discussed as the most interesting collection of monumental buildings in Spain, at any rate in Spain of the Christian tradition;

one might add that its possession of an ancient university may have a good deal to do with this. The city is on one of the main ways between what were respectively Christian and Muslim Spain. Sitwell rightly says that the fine cathedrals of Burgos and Leon might be in France; he could have added that they are along the famous pilgrim road from France via Roncesvalles to Santiago, the road along which so much early European literature was born from pilgrim tales and songs. The more one knows of Spain, or of Sitwell, the more one will appreciate this book. The illustrations are a rich collection worthy of the house of Batsford. H.J.F.

The Vedic Age. R. C. Majumdar and A. D. Pusalker (eds.). 23 × 16 cms. 565 pp. London: George Allen & Unwin, Ltd. 1951. 35/-.

This composite book, by a group of Indian scholars, reviews recent research concerning early times in India and Pakistan and does this with objective fairness and often with commendable reserve in dealing with dubious hypotheses. The different contributors naturally do not always take the same view in discussions of matters still unsettled, and these are many. Progress of research since the discoveries of Banerji and Marshall has been very rapid and it will be some time before a clear perspective is attained. India of the Old Stone Age is treated in a way that would have been quite impossible before the work of de Terra and Paterson. We see implement types now in their relation with both glacial and interglacial phases and it seems that, as would be expected, human life in India went on through the alternations of climate without such fundamental changes as were involved in the case of regions invaded by ice-sheets. The early phases of cultivation—the beginnings of Neolithic life—are only very briefly mentioned as a subject for very important future research. One would have appreciated here a longer appreciation of what Heine-Geldern has said about the "shouldered stone-axe" spreading into India from the south-east. Did that movement bring into India the idea of cultivating rice? The Indus valley cities are naturally discussed in some detail but only a little is said about the sites studied in Baluchistan, some of which may even have been preliminary to the cities. Students may be referred to Stuart Piggott's brilliant little book on *Prehistoric India* for amplification on this topic. The dating of the early days of the cities to perhaps 2,700 B.C. is now widely accepted; their decline and end is still controversial. It seems increasingly probable that they were pre-Aryan, and many, but not by any means all, think they were destroyed by horsed Aryan warriors about or before 1500 B.C. The book gives a useful summary of the work of Guha and others on the subject of the racial character of the peoples involved, but considering to what an extent all subsequent work has been based on Risley's pioneer studies, it would have been a happy thought if this book had included a real appreciation of his work. The Indus cities are now seen to have paralleled the early Mesopotamian cities in many ways, but to have been curiously static in their life.

The Aryan invasion, as the book's title suggests, is the chief theme, and we have learned surveys of language, literature, philosophy and the arts, and, separately, a detailed review of tradition as it was written down. The idea developed is that, while Aryan (Vedic) conquerors had a four-fold grouping of society (Brahmanas, Kshatriyas, Vaisyas, Sudras), caste developed especially as the conquest spread over the Ganges basin when the Vedic people were face to face with a large majority of pre-Vedic peoples. The chapters on languages are rather baffling, and one would have welcomed a discussion of Grierson's theory about a Dardic Aryan group which might have preceded the Vedic group, or might have resulted from the process of mutual assimilation of early Vedic and pre-Vedic elements. Were the Brahmanas perhaps an early element that increasingly influenced ritual as the influence of the exotic Vedic deities like Indra and Varuna declined?

The study of the Rigveda and subsequent collections of hymns and rituals is a most valuable part of this book which represents a triumph of Indian scholarship. We hope it may stimulate research in this field of early Indian evolution, which is rapidly acquiring an importance comparable with that of ancient Crete and China. H.J.F.

The Middle East. W. B. Fisher. 13.8 × 22.2 cm. xiii. 514 pp. London: Methuen, Ltd. 1950. 27/6.

This book will be widely welcomed as a modern geography of an area which until now has only been treated at length and as a whole in Hogarth's *Nearer East* (1902) and in the *Géographie Universelle* (1884 and 1929). The most valuable

parts of this work are those concerned with economic and political geography, for here the older works are especially out-of-date. Particularly well composed are the sections on the mechanics of climate, a subject on which Hogarth held unreliable ideas. The chapters on social geography include some stimulating ideas, though in a work of this sort, some of the sociology might have been better abbreviated to footnote references.

The value of the chapters on regional geography, at least for university work, would have been much improved by a fuller bibliography. For what is the geography of Persia without Curzon, of Anatolia without Wilson, Ramsay and Hogarth? A fine opportunity is also lost for a modern review of the state of exploration and mapping in Western Asia, since Hogarth's summary in the *Geographical Journal* of 1908 has for some time needed to be brought up to date. This might easily be done by an appended bibliography. The sketch-maps are sometimes disappointing. Many tell little that cannot be read from a good atlas, and some, like Fig. 17, are too generalised. A small point is that Eskishehir is consistently mis-spelt.

If carefully emended from time to time, this should long remain a valuable reference work for the geography of a region where much of importance is happening.

W.C.B.

Men Against the Desert. Ritchie Calder. 11.5 × 22.25 cm. 186 pp. London: George Allen and Unwin, Ltd. 1951. 12/6.

Calder has chosen to write here with the aim of rousing the general consciousness of men of the western civilization to a realisation of the problems and possibilities of the deserts of the world. He puts his arguments into the form of lively general talk about his journey through North Africa and Southwest Asia, flavouring it with vignettes of interesting personalities like the White Father and Dr. Goldslager. As an essay to rouse thought one hopes it may have a considerable measure of success. Its descriptions are often vivid, sometimes in curious perspective, as in the account of Jewish skill and devotion in Palestine without mention of the displaced Palestinians. It is good to have Calder's insistence that the deserts have to be studied individually, each area has its own features, and men must learn to work with nature in each environment. This is good geography.

The methods of increasing and conserving dew, and of avoiding salting of irrigated soil are among many topics briefly discussed; and now and then we are invited to glimpse a possible future, when solar radiation may have been harnessed as a source of power, and the Sahara may accordingly have acquired a new status in connection with world organisation.

H.J.F.

The Peoples of Kenya: The Taita. P. G. Bostock. 12 × 18.5 cm. 42 pp. London. Macmillan & Co., Ltd. 1950. 1/3.

This little memoir gives a most useful account of the economy, customs and traditions of a Kenya tribe. It is sad to note how so much that is thought typical of this society has to be written in the past tense. The village handicrafts are largely forgotten, the skull-caves crumbling and neglected. Particularly unhappy are the effects of a change from a self-supporting economy to a commercial agriculture. This short study can be recommended to anyone interested in the impact of modern ways on a primitive people.

W.C.B.

Wasa-Wasa: A Tale of Trails and Treasure. Harry Macfie and Hans G. Westerlund. 21½ × 14 cm. iv + 244 pp. London: Allen & Unwin. 1951. 15/-.

Many years ago the first of these authors and a comrade spent their youthful years prospecting and mining around the lakes of Ontario and in the valleys of Alaska. They lived a lonely life in isolated wood cabins and tents, a life of adventure and hardships, and often of want. But they were young enough to enjoy every day of it and sanguine enough not to lose anticipation of a fortune which never came. Much of the book deals with past conditions, but it is none the less interesting, and one feels that theirs is no imagination of adventure, but the real thing. Indians, Eskimo, wolves, cold, bears, hunger: they are all here. The title of the book, which is ably translated from the Swedish, means in an Indian dialect "distant and far away."

R.N.R.B.

The Invasion of New Zealand by People, Plants and Animals. A. H. Clark. 16.5 × 23.4 cm. xiv + 465 pp. New Brunswick: Rutgers University Press. 1949. 45/-.

Students of geography, or for that matter of the economic development of New Zealand, will welcome this book. It covers a very wide range of topics, including the domestic animals, economic crop plants, weeds and animal pests, as well as the nature and development of population. An immense amount of work has gone into its making, and is supported by a most complete general bibliography, aided by a series of reference notes, mainly bibliographical, for each chapter. Adequate illustrations, both line and half-tone, add to the attractiveness of an extremely well-written book.

There are, however, one or two comments that a reviewer may be permitted to make. In the first place, the book turns out to be a treatment, not of New Zealand, but only of the South Island, and while it is true that the inside title page has the words "The South Island," there is a definite implication that the colonising of the North Island by European people, plants and animals was effected from the South Island and not directly from overseas. No doubt there is a modicum of truth in that, but only a modicum. The evolution of the bush-burn technique for the establishment of farming in forest and scrub country was entirely a North Island invention; so was the invention of permanent grass dairy farming; hill country sheep farming in the North Island was, from the beginning, radically different from that of the South Island; *paspalum*, the dominant pasture grass of the north of the North Island, arrived direct from South America; and various other instances could be quoted. Secondly, one feels that Clark has perhaps rather over-stressed the Australian influence on the early development of sheep rearing in the South Island. His own view that previous workers had entirely overlooked this influence is understandable, though not quite accurate, and it would seem to be nearer the truth to recognise that while Australia supplied the sheep and the model for the original organisation, it was for the most part not Australians who exploited the tussock lands of Marlborough, Canterbury and Otago. In his views on the make up of the colonists from the United Kingdom Dr. Clark will touch many New Zealanders on the raw. He is perfectly right in asserting that it is almost an article of faith in New Zealand that the initial stock of British settlers was a highly selected and much better-than-average sample. Instances of settlers of lower standard hardly justify the conclusion that they were in general of poor calibre and quite ignorant of the elements of agriculture. He seems to overlook, too, that the process of settlement was going on vigorously right up to the end of the 19th century, and that many of the older inhabitants (including the present reviewer!) have first-hand memories of pioneer settlers who were of first-class calibre, both in their knowledge of agriculture and otherwise. In this context, too, Clark seems to overlook the effect of the gold rushes in attracting immigrants of more than average initiative and virility.

These are the broad impressions. It would be possible to debate numerous points of detail. The fact remains that, whatever one's own particular view either of the planning or of the major theses or of the details of information of the book, it is a first-class book and an important contribution to the extant literature on New Zealand.

R.O.B.

Arctic Trader. Philip H. Godsell. 14 × 21½ cm. xii + 320. London: Robert Hale, Ltd. 1951. 15/-.

It is not often that a travel book goes to a second edition, but this one, first published in 1935 (and reviewed in *Geography*, 1937, p. 148) has achieved that distinction. The merit of this book lies in the trustworthy picture it gives of life in the plains and mountains of northern Canada, and Alaska, by a writer who has spent most of his life as a trader and trapper of the Hudson's Bay Company. His wanderings took him as far north as the Mackenzie Delta, Herschel Island, Coronation Gulf and Victoria Island. He met the isolated stone-age Eskimos of Victoria Island and scores of other Eskimo and Indian tribes. The book is full of incident and adventure in regions that were almost beyond the white man's orbit 20 or 30 years ago, but now, thanks to radio and aeroplane, are within the realm of trader and police. The author has plenty of material, perhaps too much, for he has little space for description of the country or its animal life beyond the fur-

bearing animals. But for a view of the scenes that are passing and a vista of some hundred thousand miles of Arctic trail it would be hard to beat if only it included a map.
R.N.R.B.

The Hereford World Map. G. R. Crone. 14.2 × 21.2 cm. 15 pp.
London: The Royal Geographical Society. 1948. 1/6.

No geographer needs to be reminded that the Hereford Map is, as Mr. Crone describes it, "a unique national treasure." He has produced a modest, though useful, little booklet that not only summarises all the essential knowledge we have of the map and its author but can be slipped into the pocket when making the pilgrimage to Hereford Cathedral that every student of the subject should undertake.

The map illustrates more forcibly than could any treatise the limitations of outlook regarding the size and shape of the earth imposed by ecclesiastical scholarship upon the western world before the Reformation. One might wish that the booklet were a little more substantial, but it is a harbinger of a more ambitious work on the subject which the Royal Geographical Society is proposing to publish.
R.A.P.

The Earth's Crust. L. Dudley Stamp. 19 × 26 cm. viii + 120 pp.
London: George Harrap & Co., Ltd. 1951. 18/-.

It seems safe to predict that this volume may have an even wider circulation than any of Professor Stamp's other books. For whilst it will obviously be a widely used textbook for Sixth Forms and First Year University classes, it is intended for an even wider public. Professor Stamp states that "nearly everyone is interested in scenery" and he has attempted to explain to them "the why's and wherefores of the great differences in scenery"; differences which are so often due to geological control.

He claims that he has used "a New Approach" in that the book has been written round a number of models. Some of them are generalized examples of common features like a High Mountain Valley or a Young River Valley, but the majority of the models are of actual pieces of country. The western end of the Isle of Wight, the Malham country in the Pennines, the North Downs near Box Hill, Castle Rock, Edinburgh, the Peruvian Desert and the Grand Coulee and Crater Lake in the U.S.A., may be mentioned as giving an idea of the wide range of variety offered. The areas to be modelled have been most carefully selected, whilst the models are beautiful pieces of work.

Professor Stamp claims that the use of models is preferable to the more orthodox photographs. Certainly one great advantage is that the geological sections on the sides of the models make the control of geology on scenery leap to the eye. But perhaps there has been a little too much reliance on the models. The coloured plates tell the general story admirably, but the half-tones illustrating detail, are considerably less successful, for there is a limit to the model maker's art. The rounding of boulders by a stream, for example, could be shown better by photographs, such as those that adorn many other textbooks of physical geology.

But this is only a small point of criticism: in general there is so much to praise. The text, which covers the usual material of a fairly elementary work on physical geology or geography, is written with the lucidity one expects from Professor Stamp's pen. The model maker, Mr. T. Bayley, and the publishers deserve high praise, for carrying out so well, and at not too unreasonable a price, Professor Stamp's ingenious idea of a framework on which to hang his New Approach.
J.F.K.

Géographie Agraire, Types de Culture. Daniel Faucher. 16.75 × 25.25 cm. 382 pp. Paris: Libraire de Medicis. 1949. 1,200 fr.

This product of long experience and meditation comes from a mind grounded in the French tradition. Demangeon once said in his own witty way "Your god in England is comfort, ours is the soil." The book first reviews briefly the lowly modes of life, by collection of plants, small animals and hunting, by cultivation as a supplement to hunting, by itinerant cultivation with its widespread and often disastrous accompaniment of burning of trees, bush or grass, and by sedentary agriculture with, often, trees as a factor promoting fixation, and domestic animals often in early stages hardly more than a necessary evil. The evolution of two-field and three-field systems is briefly mentioned, and, in this section, one could wish

that Faucher had discussed, even in a paragraph, the widespread occurrence of the two-field system in some parts of England. He makes the two-field scheme south European and the three-field system west and north-west European, and he omits the "in-field and out-field" system and other varieties of European cultivation. His chapters on the agrarian revolution are fascinating. A pattern was changed, but only through linkage of a number of complementary developments. More animals were needed to dung the soil and avoid exhaustion. But this involved winter feed and therefore the spread of lucerne, clover and root crops. It was also greatly promoted by the spread of maize, potato, sugar beet and other crops. In some not very favourable regions wheat might give a harvest, in poor seasons, of not more than five grains for each one sown, even if the harvest were not ruined by rain as happened too often in parts of Britain. Wheat had therefore, in some places, receded in favour of rye which was less often ruined by the weather and tended to give at least seven grains for each one sown. Maize, in contrast, might give scores of grains per grain sown and its requirements from the soil seem to differ to some extent from those of wheat. A biennial rotation of wheat and maize was established in south-west France, but it brought the need for better and specialised manuring of the fields.

So each new step gave incentives to other changes and we reach the stage of rising standards of food and demands for produce of quality by town populations increasingly buying in a market which has become a world-market. The farmer in many lands from the equator to the polar circles has become, willy-nilly, a speculator who must apply new specialisations that an established routine has made to appear precarious. Improved breeds of animals depend often on rotation grasses, and here we could wish that Faucher had been in touch with the great work of Sir George Stapledon.

The book avoids discussion, beyond brief mentions, of the bearing of agricultural changes on types of social organisation, though the author often has these in mind. Naturally the post-1945 period gets less attention and the green revolution of the 1920-50 period in east-central Europe is not specially treated though the tendency to over-population is mentioned as an accompaniment of farming without hired labour. There is too little attention to the mistakes made in modern agricultural methods and the student might with advantage read Gourou's fine little book *Les Pays Tropicaux* for an appreciation of problems in the hot wet regions and some of the works on Dust-bowls and other disasters. Altogether, this is a very live book, written with a good, easily understandable style and a rich background of direct knowledge and wide reading. H.J.F.

Géographie de l'Energie. Pierre George. 16.75 × 25.25 cm. 469 pp. Paris: Librairie de Medicis. 1950. 1,200Fr.

Professor George has made a welcome contribution to the geography of mechanical power. His book is Volume IV in a series of textbooks on Economic and Social Geography edited by M. André Cholley. The survey deals with sources of power and also with their modes of exploitation on a world basis.

The meagre coal resources of Europe are contrasted with those of the U.S.A., the U.S.S.R. and China, where the figures available are probably conservative. It is only to be expected that the ground covered here adds little to our existing knowledge. Some printer's errors occur, e.g. L(l)wyd and Sirhow(y) (p. 36), Kanawka and smokeness (p. 76), and Pennsylvania cannot be translated as *Pensylvanie*. The map of Europe's coalfields is inaccurate, especially with regard to Great Britain, the East Kent coalfield appearing in Surrey. Professor George's erudition in describing the coalfields of Viet Nam is, on the other hand, impressive. The treatment of methods of exploiting coal strikes a novel note, the traditional free enterprise of Great Britain, prior to the establishment of the National Coal Board, being contrasted with the authoritarian system of pre-war Germany and the state-planned organization of the U.S.S.R.

The second section of the book deals with petroleum and natural gas, now the most serious competitors of coal. A map of the U.S.A. includes the new Big Inch and Little Big Inch pipe lines, the one conveying crude and the other refined oil from Houston and Galveston to New Jersey and Philadelphia via the Middle West. The existence of oil shale and petroleum in Great Britain appears to be unknown, although a refinery is marked on Fig. 13, which is presumably Fawley, Southampton. In the petroleum industry there is little vertical integration as in that of coal, and also an apparent inability to create a complex economy at the site of production. The new oil towns of Texas and the Middle East are described

as "stations of pipe-lines," the Russian centre of Baku providing a marked exception, in view of its long pre-oil history.

The third section, on electrical power, deals with thermal, hydro-electric and atomic stations. The great thermal station of St. Denis, on the banks of the Seine, appeals to Professor George for detailed description and suggests comparison with its counterpart at Battersea. The high *per capita* development of hydro-electricity in Canada, Norway and Sweden is contrasted with central Africa, with its vast potentialities. There is no mention of the Val d'Isère project for the French Alps, nor of the Snowy River multi-purpose scheme for south-eastern Australia. The atomic plants at Oak Ridge (Tenn.) and Châtillon (France) are noted, but not that at Harwell (Berks.).

The book is fully illustrated with maps, graphs, diagrams and photographs, many of which are pleasing and original. An extensive bibliography is appended and the index is divided under technical terms and place-names. This is an excellent and lucid account of the world's power resources and may be recommended as a standard work of reference. A.F.A.M.

World Geography of Petroleum. American Geographical Society Special Publication No. 31. W. E. Pratt and Dorothy Good (Editors). 17.5 × 25.25 cm. xvii × 464 pp. 1 fold map. Princeton University Press. American Geographical Society. 1950. 48/-.

This volume comes opportunely when for several reasons petroleum affairs are of even more than usual general interest. As an encyclopaedic symposium by twenty experts, mainly geologists, it will have a more permanent value. Three-fifths of the book is occupied by detailed accounts of the world's petroleum regions. By far the longest section is on the Middle East, with a particularly long chapter on Saudi Arabia and Bahrein. The next most extensive treatment is given to Venezuela and the United States. It is evident that space has been allotted not only according to the estimated petroleum reserves in the various regions but according to the difficulty American readers may experience in finding information elsewhere, and, as in the short chapter on the U.S.S.R., has been influenced by non-accessibility of first-hand data. The Academy of Sciences of the U.S.S.R. not having responded to the request for an article by a Soviet authority, Mr. Eugene Stebinger gallantly stepped into the breach, leaving one to wish that he had been rather less reluctant to pursue the discussion of "guestimates" by his comparative method.

The regional chapters do not all follow the same plan. One of the most complete and best-ordered, that on Venezuela by Mr. Zuloaga, covers the place of Venezuela fields in world petroleum economy, the character of the products, the relation of the oilfields to the regional geography, the geology of the individual fields, the history of development, its repercussion on the economy of the country and petroleum legislation. The regional treatment in Part III ends with a summing-up of the fundamental facts on occurrence and exploration, topics already dealt with in Part I by Mr. Stebinger. Development, production, storage, transport, refining and distribution are briefly discussed in a general way in Part II. Utilization in peace and war and political aspects are almost as briefly sketched in Part IV.

In a book written mainly by petroleum geologists it is to be expected that problems of production will receive the weight of emphasis. The reader is given much information on present and potential production but, as the technical editor, Mr. Wallace E. Pratt, points out in his foreword, is left to form his own judgment. He may, for instance, use the statistics of production and export (provided for 1938 and 1947) to work out his own problems. But, in a work presumably not intended only as a reference book for the petroleum geologist, it may be felt that the economic and political aspects deserve more extensive treatment than is here allotted to them. There is scope, for instance, for some systematic analysis of the location of the refining industry. While several chapters touch on the political complications so frequently associated with oilfield development and some international aspects are discussed in the final chapter, a fuller treatment would have been welcome. Some of the chapters provide incidental illustrations of the impact of oilfield development on the way of life in certain countries, but the reader is not given an adequate general idea of the part played by petroleum development as one of the most important spearheads of capital investment in under-developed countries. The consequences

on the finances and on the general economy in the various countries of this injection of modern industrialism might also have been followed out. In his chapter on availability of petroleum, a revised version of his 1947 British Association address, Professor Mather points out that annual demand for this non-renewable resource is at present something like 1 per cent. of the world's actual reserves and will increase greatly in the next few years because of increased consumption in the producing countries themselves. Some regional studies of the consumption of petroleum and its products would have added greatly to the value of this book.

The volume contains a number of striking photographic illustrations of oilfield landscapes. There are several useful cartograms showing inter-regional movement of oil. The regional maps suffer on the whole from small scale and crowding and would probably have gained by being more diagrammatic. There are notes on conversion factors and glossaries, a bibliography and index, each of the last two running to 24 pages.

C.J.R.

Géographie de la Circulation sur les Continents. R. Capot-Rey. 14.25 × 22.75 cm. 296 pp. Abbeville. Librairie Gallimard. Series *Geographie Humaine* No. 20. 1946. 320 fr.

As is indicated by its being one of a series on human geography, Professor Capot-Rey's book deals primarily with human movement as one aspect of the response to environment and as exercising in turn its own influence on mankind. In this admirably presented study of a fascinating subject, four themes are therefore constantly interwoven: environment, man, human culture and human movement. In the first instance the author deals with movement in relation to the mode of life and the material and non-material needs of various nomadic and sedentary peoples. This is followed by a survey of means of transport and their evolution in characteristic environments, such as forests, deserts, mountains and river valleys; and by chapters on the influence of communications on villages and towns, in advancing colonisation, in urban drift and in changing the pattern of human settlement and modes of human life generally. He displays throughout an insight into the significance of geographical movement in relation to cultural values and the positive creation as well as the satisfaction of needs which travel engenders. The book contains a good bibliography, mainly French but with some English and a few German references. It has no index. It includes numerous illustrations but only one map—a world map of *non-mechanical* means of transport: the poverty of cartographical illustration is a major fault.

D.S.

The Sea and its Mysteries. John S. Colman. 12.5 × 19 cm. 285 pp. London: G. Bell & Sons, Ltd. 1950. 12/6.

An admirable introduction to oceanography and one well calculated to interest and instruct the general reader. A useful short bibliography shows the way to further reading. As a text for students, however, the very ill-balanced field renders the book of limited value. There are frequent irritating repetitions sometimes almost as if the chapters were by different hands. On p. 38 Pliocene appears for Pleistocene, while on p. 71, there occurs what seems to be a printer's pie. There are many good plates and diagrams and an indifferent world map of submarine depths.

R.M.

A Handbook of Social Studies. J. Dray and D. Jordan. 12.5 × 19 cm. x + 144 pp. London: Methuen & Co., Ltd. 1950. 7/6.

This is a tantalising book, at times stimulating and thoughtful, at times facile, glib and ineffective. There is some excellent advice on progressive teaching methods, on some practical matters such as organisation in the classroom, and the presentation of data. On the other hand, the authors do not seem to be anxious to be specific about the content of their course. "Spare us," they say, "from any precise agreed syllabus." "Social studies . . . is something which happens to a person, not something studied by him." The burden of the authors' plea in regard to method, which they regard as being as important as, if not more important than, content, is for a flexible approach in which the children discover the answers to questions which they themselves have formulated. This involves group work, pooling information, and sharing and presenting results. Many teachers will readily agree on the value of such methods. The authors, however, do not strengthen their case by assuming that the only alternative is rigid formality on academic lines. To attack a type of education in which children

"know all about Guild regulations in the Middle Ages, but nothing about Trade Union restrictions in our own times" is to attack the exception, not the rule. Teachers are not often as unrealistic as the authors appear to think.

Geographers will welcome the idea, not novel to them, of approaching a study as it were concentrically, from the child outwards through the homeland to the world. In the last chapter, "A social studies course in outline," these circles are considered as intersecting all the main branches of knowledge (not including history, which is regarded not as a subject but as "a dimension"), and questions to be answered are suggested. There are 24 sections with seven to ten questions each. One question is: "What varieties of scenery and climate are found in the Commonwealth?" Since the questions cover any and every subject in the curriculum, it appears that social studies must either be superficial, or else must occupy most of the time-table.

E.W.H.B.

Social Studies in Secondary Schools. School Broadcasting Council for the United Kingdom. 18.5 × 24 cm. 23 pp. London: British Broadcasting Council. 1950. N.P.

This booklet summarises information gathered by officers of the School Broadcasting Council relating to the planning of broadcasts for older children in secondary modern schools. Interesting facts and expressions of opinion, especially about the "extra year" courses, are here set out, including attempts to plan the work of 14-year-olds along the lines of projects, local studies, and current affairs. A good summary and some shrewd comments follow. A general aim seems to be "to help children to understand the world in terms of concrete and practical problems which human beings have to face." Geographers will feel how closely this accords with their own aims and be inclined to agree that "good subject teaching and projects very often overlap." As an interim summary of some aspects of a pressing problem, this survey from the broadcasting angle has value.

E.W.H.B.

Visual Aids. Films and Filmstrips. Part II. Geography for Secondary Schools. (Revised and Enlarged). Educational Foundation for Visual Aids. 14 × 21.5 cm. vii + 200 pp. London: Educational Foundation for Visual Aids. 1951. 3/-.

This new catalogue appears to be a comprehensive, well arranged compendium. The brief summary of the contents of each film or filmstrip should serve as a useful guide to the intending hirer or purchaser. The only lack appears to be that of any grade of quality for any of the material included.

VISUAL AIDS COMMITTEE.

What the World Wears. R. K. and M. I. R. Polkinghorne. 19 × 26 cms. 134 pp. London: George G. Harrap & Co., Ltd. 1949. 12/6.

This is a beautifully produced book and one fascinating to read wherever one happens to open it. It is a storehouse of information on the geography and history of materials for clothing the human form, head to foot, and on methods of manufacture. Geography is met with at countless points all through the book. Clearly there has been very careful planning in the preparation of the work and a most commendable insistence on getting the desired picture-sequence for each topic. It is lavishly illustrated with large pictures of the highest quality.

The book provides a centre of interest and stimulation around which a class is encouraged to build a body of "research" information, and of collections for exhibition, by the schemes of suggestions of "things to do" appended to every section. While the greater number of these are exercises in geography, many pieces of work give training in other subjects, and much attention is drawn to technical processes.

The information given is precise and trustworthy. Only one thing need be mentioned: perhaps the authors will enquire again about the speed of machine-clippers for shearing.

Written in a pleasantly straightforward style, neither arch nor dull, it is an excellent book for the class library of the senior class of the Secondary Modern School, certain of being avidly read, especially by the girls. It is recommended for the reference library of the Grammar School.

F.J.C.

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It is the first comprehensive treatise on the subject printed in England since A. R. Clarke's *Geodesy* of 1880, and brings together much that is only to be found in a very large number of scattered papers and periodicals. Special attention has been given to methods and ideas developed in India and the United States.

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GEOGRAPHY

INDEX TO VOL. XXXVI

1951

AUTHORS

	PAGE
Agnew, Swanzie : The Cultural Heritage of Bas Languedoc, France ..	44
Balchin, W. G. V. : The Representation of True to Scale Linear Values on Map Projections	120
Birkby, M. Dyls : The Wattle Industry in Natal	150
Botley, F. V. : A Globe Segment	193
Broadhurst, Bertha M. : The Teaching of Geography for International Understanding I : Secondary School Geography	83
Brown, T. W., and Alice Garnett : The International Conference of Teachers of Geography ; Sheffield, August 1951. Report	221
Callow, J. : The World Land Use Survey	231
Darby, H. C. : The Clearing of the English Woodlands	71
Debenham, F. : Livingstone's Africa and Future Development	107
Garnett, Alice and T. W. Brown : The International Conference of Teachers of Geography, Sheffield, August 1951. Report	221
Gilbert, E. W. : Seven Lamps of Geography. An Appreciation of the Teaching of Sir Halford J. Mackinder	21
Haddon, J. : Newspapers in the Geography Class	124
Hattersley, P. E. : The French Element in the Population of Eastern Canada	89
Howe, G. M. : A Note on the Application of Air Photography to the Agricultural Geography of north-west Cardiganshire	15
Jarrett, H. R. : Bathurst. Port of the Gambia River	98
Maas, W. : The "Dutch" Villages in Poland	263
Morgan, R. L. R. : Some Comparative Aspects of World Sea Fisheries ..	111
Phillips, Rosetta F. : The Teaching of Geography for International Understanding II ; Teacher Training and Supply of Information to Teachers of Geography	85
Pounds, N. J. G. : The Ruhr Area. A Problem in Definition	165
Rawstron, E. M. : The Distribution and Location of Steam-driven Power Stations in Great Britain	249
Robinson, H. : Geography in the Dissenting Academies	179
Scott, J. T. : Geographical and Historical Factors associated with the Industries and Occupations of Chester	51
Scott, P. : The Iron and Steel Industry in South Africa	137
Sparks, B. W. : Two Drainage Diversions in Dorset	186
Stamp, L. D. : Some Neglected Aspects of Geography (Presidential Address)	1
Widdowson, B. C. : A Universal System of Map Referencing	198
Wise, M. J. : Some Notes on the Growth of Population in the Cannock Chase Coalfield	235

ARTICLES AND NOTES

Bathurst. Port of the Gambia River	98
Bibliography of Works of Halford John Mackinder	41
Clearing of the English Woodlands	71
Comparative Aspects of World Sea Fisheries	111
Correspondence :—	
K. C. Edwards : Geography at the Seventh New Zealand Science Congress	201

	PAGE
O. Garnett : Techniques in Local Field Studies	55
A. Geddes : An " Outlook Tower " at Domme, Dordogne	127
R. Miller : A Map Projection Rediscovered	270
Cultural Heritage of Bas Languedoc, France	44
Distribution and Location of Steam-driven Power Stations of Great Britain	249
" Dutch " Villages in Poland	263
French Element in the Population of Eastern Canada	89
Geographical and Historical Factors associated with the Industries and Occupations of Chester	51
Geographical articles in Magazines received	68, 218
Geographical Association :—	
Acknowledgments and Library Acquisitions	273
Annual Conference, 1951	59
Annual Conference, 1952	202, 271
Annual Conference Teas	61, 271
Annual Report, 1950	57
Back Numbers of <i>Geography</i>	130, 272
Branch Meetings and Visits at Headquarters	131, 202
Corrections to <i>Geography</i> , Dec., 1950 ; March, 1951	60, 131
Covenanting of Annual Subscriptions	271
Exhibition of textbooks and other materials at Headquarters	61
Financial Year	203, 271
International Conference of Teachers of Geography, Sheffield, August, 1951	129, 202, 272
(For Report, see " International Conference, etc.")	
Library	60
Notification of changes of address	30
Offprints available to members	203
O.S. Map sets	203, 272
President, 1952	271
Publication dates	60, 203
Revenue Account, 1950	205
Spring Conference, 1951	129
Spring Conference, 1952	202, 272
Subscription rates and the new Financial Year	60
Summer Closing of Headquarters	202
Summer School for Field Work in Geography, 1952	202, 272
Geography in the Dissenting Academies	179
Globe Segment	193
International Conference of Teachers of Geography, Sheffield, August, 1951. Report	221
Iron and Steel Industry in South Africa	137
Livingstone's Africa and Future Development	107
Neglected Aspects of Geography	1
Newspapers in the Geography Class	124
Note on the Application of Air Photography to the Agricultural Geography of north-west Cardiganshire	15
Notes :—	
B.B.C. Geography Broadcasts to Schools	61, 130
Danish Tour	61
<i>Geographical Magazine</i>	60, 272
Imperial Institute—" Stories of Empire Products "	62
Information about Aluminium	62
International Geographical Congress, Washington, D.C., August, 1952. International Geographical Union	131, 203
Papers by Sir Halford J. Mackinder (Reprints)	61
Royal Geographical Society Festival Exhibition	131
Royal Norwegian Government Scholarships	61
Vacation Courses in Meteorology, C.P.F.S.	204
Notes on the Growth of Population in the Cannock Chase Coalfield	235
Obituary :—	
Professor Johann Sölch	269
Projected Union of Associations of Teachers of Geography	230

	PAGE
Representation of True to Scale Linear Values on Map Projections ..	120
Ruhr Area. A Problem in Definition	165
Seven Lamps of Geography. An Appreciation of the Teaching of Sir Halford J. Mackinder	21
Teaching of Geography for International Understanding. 1, Secondary School Geography. II, Teacher Training and Supply of Information to Teachers of Geography	83
Two Drainage Diversions in Dorset	186
Universal System of Map Referencing	198
Wattle Industry in Natal	150
World Land Use Survey	231

ILLUSTRATIONS, MAPS AND DIAGRAMS

Bathurst. Port of Gambia River :—	
Fig. 1—St. Mary's Island and adjacent territories	99
Fig. 2—The St. Mary Peninsula	101
Fig. 3—A typical Bathurst Compound	102
Fig. 4—Functional Areas in Bathurst	103
Comparative Aspects of World Sea Fisheries :—	
Fig. 1—Characteristics of Representative Countries in each type of fishing economy	115
Cultural Heritage of Bas Languedoc, France :—	
Fig. 1—Bas Languedoc	46
Distribution and Location of Steam-driven Power Stations in Great Britain :—	
Fig. 1—Coal-driven electricity generating Stations. Capacity in 1948	250
Fig. 2—Coal-driven electricity generating Stations. Output in 1946-47	251
Fig. 3—Coal-driven electricity generating Stations in the London area. Capacity in 1948	252
Fig. 4—Coal-driven electricity generating Stations in the London area. Output in 1946-47	253
Fig. 5—The Development of Public Electricity Supply in Great Britain, excluding North of Scotland District	255
Fig. 6—Coal-driven electricity generating Stations. Capacity of post-1948 development	257
Table 1—Power Consumption, 1947-48 in Bournemouth, Stoke-on- Trent, Coventry, Brighton, Derby, Leeds, Sheffield	253
French Element in the Population of Eastern Canada :—	
Fig. 1—Distribution of the French Element in the Population of Eastern Canada	91
Fig. 2—Composition of the population, Province of Quebec, Dominion Census, 1941	92
Geographical and Historical Factors associated with the Industries and Occupations of Chester :—	
Fig. 1—Site of Chester	52
Fig. 2—Industries of Chester	53
Globe Segment :—	
Fig. 1—Removal of a segment from a large globe	197
Fig. 2—Dimensions of the segment	197
Fig. 3—Global Ruler	197
Fig. 4—Segment construction	197
Fig. 5—Paper cut to cover global surface	197
Fig. 6—Approximate plotting of a rhumb-line	197
Table I—Co-ordinates for use in construction of segment of 20 deg. rad., globe radius 50 cm.	194
Table II—Distances and bearings of graticule intersections on segment globe	196
Iron and Steel Industry of South Africa :—	
Fig. 1—South African Iron and Steel Industry	139
Fig. 2—Transvaal Iron and Steel Industry	143
Fig. 3—Natal Iron-Smelting Industry	147
Neglected Aspects of Geography :—	
Fig. 1—Determinism represented diagrammatically	3

	PAGE
Fig. 2—Modified determinism	3
Fig. 3—Population Density 1950 (World)	9
Fig. 4—Map of the World showing rate of population increase 1940-48	10
Fig. 5—Diagram showing age composition of the population of Great Britain	11
Fig. 6—Examples of mille-maps	13
Note on the Application of Air Photography to the Agricultural Geography of north-west Cardiganshire :—	
Fig. 1—Interpreted air photograph of land use	opp. 16
Fig. 2—Deciduous woodland	17
Fig. 3—Coniferous woodland	17
Fig. 4—Heathland, woodland and rough pasture	17
Fig. 5—Improved permanent grass	20
Fig. 6—Arable or tilled land	20
Fig. 7—Rotation grass	20
Notes on the Growth of Population in the Cannock Chase Coalfield :—	
Fig. 1—The Cannock Chase Region—Population, 1801	236
Fig. 2— " " " " " " 1841	237
Fig. 3— " " " " " " 1901	238
Fig. 4— " " " " " " 1931	239
Fig. 5—Cannock Chase Coalfield. Comparative Rates of Population increase in selected parishes	240
Fig. 6—Cannock Chase. Sex Distribution, 1931	242
Fig. 7—Cannock Chase Urban District Distribution of Population by age and sex, 1931	244
Fig. 8—The Cannock Chase Region. Settlement pattern, 1830, 1900, 1946	245
Fig. 9—Cannock Chase. Insured Population by Industrial Groups, 1947	247
Representation of True to Scale Linear Values on Map Projections :—	
Fig. 1—Comparative graticules of simple zenithal projections	121
Fig. 2—Comparative graticules of simple conical projections	122
Fig. 3—Comparative graticules of simple cylindrical projections	123
Ruhr Area. A Problem in Definition :—	
Fig. 1—Distribution of metal and textile working in Düsseldorf-Mettmann, Wuppertal, Solingen and Remscheid	166
Fig. 2—Area of the worked coalfield	167
Fig. 3—Distribution of industry within the Ruhr area	169
Fig. 4—Service and supply area of the Ruhr	171
Fig. 5—Landscape types in the Ruhr area	172
Fig. 6—Ruhr area as defined by the U.S. State Dept. and the <i>Institut National de la statistique</i> of France	173
Fig. 7—Territories controlled by the Water Control Authorities in the Ruhr area	175
Fig. 8—Areas occupied under French leadership, 1921-24, and boundary of proposed Ruhr-Rhineland territory, 1945	177
Seven Lamps of Geography :—	
Halford John Mackinder. A portrait	opp. 21
Fig. 1—Towns in which H. J. Mackinder gave courses of Oxford University Extension Lectures, 1885-1893	27
Two Drainage Diversions in Dorset :—	
Fig. 1—Escarpments of the Weymouth lowland	187
Fig. 2—Structural features and landforms at the head of the Coomb valley	189
Fig. 3—Landforms at Coryates	191
Universal System of Map Referencing :—	
Fig. 1—Grid for 9 deg. area, scale 1 : 20,000,000	199
Wattle Industry in Natal :—	
Fig. 1—Wattle areas and physique of Natal	151
Fig. 2—Wattle areas, native locations and communications in Natal	161
Fig. 3—Growth of wattle exports from Natal	163
Table I—Average monthly temperatures in the Wattle Belt, 1940	153
Table II—Monthly extreme temperatures at Howick and Pietermaritzburg	153
Table III—Monthly rainfall in the Wattle Belt, 1940	154

REVIEWS OF BOOKS

	PAGE
American Geographical Society Special Publication No. 31. W. E. Pratt and Dorothy Good (eds.) : World Geography of Petroleum	282
Arctic Trader. P. H. Godsell	279
Association for Education in Citizenship. J. Hemming (compiler) : Sixth-Form Citizens	66
Bostock, P. G. : The Peoples of Kenya : The Taita	278
Britischen Inseln. Band I, England and Wales. J. Sölch	269
Calder, R. : Men against the Desert	278
Capot-Rey, R. : Géographie de la Circulation sur les Continents	283
Carman, E. D. : Soviet Imperialism	64
Church, R. J. Harrison : Modern Colonization	211
Clark, A. H. : The Invasion of New Zealand by People, Plants and Animals	279
Colman, J. S. : The Sea and its Mysteries	283
Companion into Cheshire. J. H. Ingram	275
Crone, G. R. : The Hereford World Map	280
Dartmouth. P. Russell	63
Dicken, S. N. : A Regional Economic Geography	65
Dobby, E. H. G. : Southeast Asia	212
Dray, J., and Jordan, D. : A Handbook of Social Studies	283
Earth's Crust. L. D. Stamp	280
East, W. G., and Wooldridge, S. W. : The Spirit and Purpose of Geography Educational Foundation for Visual Aids : Visual Aids. Films and Filmstrips Part II. Geography for Secondary Schools (Revised)	284
Edwards, T. : The Face of Wales (Face of Britain Series)	214
Evans, T. W. : Land Potential	215
Face of Wales (Face of Britain Series). T. Edwards	214
Faucher, D. : Géographie Agraire. Types de Culture	280
Fisher, W. B. : The Middle East	277
Géographie Agraire. Types de Culture. D. Faucher	280
Géographie de la Circulation sur les Continents. R. Capot-Rey	283
Géographie de l'Energie. P. George	281
Geography in the Twentieth Century. Griffith Taylor (ed.)	208
George, P. : Géographie de l'Energie	281
Godsell, P. H. : Arctic Trader	279
Good, Dorothy and Pratt, W. E. (eds.). American Geogr. Soc. Spec. Publication No. 31 : World Geography of Petroleum	282
Handbook of Social Studies. J. Dray and D. Jordan	283
Hanson, E. P. : New Worlds Emerging	216
Harrison Church, R. J. : Modern Colonization	211
Hemming, J. (compiler). Association for Education in Citizenship : Sixth Form Citizens	66
Hereford World Map. G. R. Crone	280
Herdsmen and Hermits. T. C. Lethbridge	216
History of the Isle of Man. R. H. Kinvig	214
Hogg, G. : Turf beneath my Feet	63
Industrial Development of South Wales, 1750-1850. A. H. John	215
Ingram, J. H. : Companion into Cheshire	275
Invasion of New Zealand by People, Plants and Animals. A. H. Clark	279
John, A. H. : The Industrial Development of South Wales, 1750-1850	215
Jordan, D. and Dray, J. : A Handbook of Social Studies	283
Jorré, Georges : The Soviet Union	213
Kinvig, R. H. : A History of the Isle of Man	214
Land Potential. T. W. Evans	215
Lethbridge, T. C. : Herdsmen and Hermits	216
London Essays in Geography. Rodwell Jones' Memorial Volume. L. D. Stamp and S. W. Wooldridge (eds.)	210
Macfie, H. and Westerlund, H. G. : Wasa-Wasa. A Tale of Trails and Treasure	278
McKie, R. C. This was Singapore	64
Matheson, D.M. : Places of Natural Beauty. National Trust Guide	276
Majumdar, R. C. and Pusalker, A. D. (eds.) : The Vedic Age	277

	PAGE
Men against the Desert. R. Calder	278
Middle East. W. B. Fisher	277
Middle Sea. L. G. Pine	63
Modern Colonization. R. J. Harrison Church	211
Mogey, J. M. : The Study of Geography	211
New Worlds Emerging. E. P. Hanson	216
Our East Anglian Heritage. L. J. Redstone	275
Peoples of Kenya : The Taita. P. G. Bostock	278
Pine, L. G. : The Middle Sea	63
Places of Natural Beauty. National Trust Guide. D. M. Matheson	276
Polkinghorne, R. K. and M. I. R. : What the World Wears	284
Pratt, W. E. and Good, Dorothy (eds.). American Geogr. Soc. Spec. Publication No. 31 : World Geography of Petroleum	282
Pusalker, A. D., and Majumdar, R. C. (eds.) : The Vedic Age	277
Redstone, L. J. : Our East Anglian Heritage	275
Regional Economic Geography. S. N. Dicken	65
Russell, J. : Switzerland	276
Russell, P. : Dartmouth	63
School Broadcasting Council : Social Studies in Secondary Schools	284
Sea and its Mysteries. J. S. Colman	283
Seas and Shores of England. E. Vale	274
Sitwell, Sacheverell : Spain	276
Sixth-Form Citizens. Association for Education in Citizenship. Report compiled by J. Hemming	66
Social Studies in Secondary Schools. School Broadcasting Council	284
Sölch, J. : Die Britischen Inseln. Band I, England and Wales	269
Sölch, J. : Wissenschaftliche Aufgabe der modernen Geographie	64
Soviet Imperialism. E. D. Carman	64
Soviet Union. Georges Joré	213
Southeast Asia. E. H. G. Dobby	212
Spain. Sacheverell Sitwell	276
Spirit and Purpose of Geography. S. W. Wooldridge and W. G. East	211
Stamp, L. D. : The Earth's Crust	280
Stamp, L. D., and Wooldridge, S. W. (eds.) : London Essays in Geography. Rodwell Jones' Memorial Volume	210
Study of Geography. J. M. Mogey	211
Switzerland. J. Russell	276
Taylor, Griffith (ed.) : Geography in the Twentieth Century	208
This was Singapore. R. C. McKie	64
Turf beneath my Feet. G. Hogg	63
Vale, E. : Seas and Shores of England	274
Vedic Age. R. C. Majumdar and A. D. Pusalker (eds.)	277
Visual Aids. Films and Filmstrips Part II. Geography for Secondary Schools (Revised). Educational Foundation for Visual Aids	284
Wasa-Wasa. Tale of Trails and Treasure. H. Macfie and H. G. Westerlund	278
Westerlund, H. G., and Macfie, H. : Wasa-Wasa. A Tale of Trails and Treasure	278
What the World Wears. R. K. and M. I. R. Polkinghorne	284
Wissenschaftliche Aufgabe der modernen Geographie. J. Sölch	64
Wooldridge, S. W. and East, W. G. : The Spirit and Purpose of Geography	211
Wooldridge, S. W., and Stamp, L. D. (eds.) : The Spirit and Purpose of Geography. Rodwell Jones' Memorial Volume	210
World Geography of Petroleum. American Geogr. Soc. Spec. Publication No. 31. W. E. Pratt and Dorothy Good (eds.)	282

REVIEWS OF TEXTBOOKS

Asia. Modern Geography Series Book V. W. B. Cornish	66
Barbour Simpson, A. R. : Europe	217
Cornish, W. B. : Asia. Modern Geography Series Book V	66
Europe. A. R. Barbour Simpson	217
Fairgrieve, J. and Young, E. : Human Geographies. Books I and II	217
Human Geographies. Book I British Isles. Book II Atlantic Hemisphere. J. Fairgrieve and E. Young	217

REVIEWS OF FILMSTRIPS

	PAGE
Atolls and Lagoons	134
Canada No. 4. The Maritime Provinces and Newfoundland	136
East Central Scotland	134
Exploring the Landscape. Snow and Ice	133
Icebergs	134
Meet your Neighbour Series. How do you Travel?	133
Middle East—Strip 1. Natural Background	67
North America: California	135
North America: The Canadian Prairies	135
Physical Geography Series: Lakes	133
Scottish Highlands	134
West Central Scotland	135
Wool Industry of Australia	67

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